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ATHEROMATOUS LESIONS IN BENGAL : OBSERVATIONS ON 4000 UNSELECTED AUTOPSIES

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Introduction

The Journal of the Indian Medical Association (1941) in its editorial observation on ætiology of cardiac diseases in India pointed out the paucity of information with regard to the incidences of the grave and interesting malady of coronary thrombosis. It was also pointed out that proper attention has not been paid to this subject in India and more clinical and post mortem studies are needed. We consider that this statement will be generally shared by the medical public of this country. The most vital need is autopsies and more autopsies. Pointed attention of the medical profession of India have already been drawn to this important subject (Tribedi, 1940 and 1941). Due to the lack of requisite number of suitable autopsies, we are unable to collect the data concerning the diseases of the coronaries direct. Hence, the next possible alternative would be to get the informations regarding the general arterial system. Although the problem of the coronary arteries are more complicated because of the constant contraction and relaxation of the cardiac musculture within which the coronaries are embedded, the changes that are found in other parts of the arterial tree might be expected to be reflected also to certain extent to these branches. With this end in view we are putting down our observations on the arterial changes that we have collected, so that some idea as to the condition of the coronaries can be made.

Pathogenesis

"A man is as old as his arteries" is an oft-quoted expression meant for impressing upon the lay people the hazards associated with "arteriosclerosis". The latter term is apparently self-explicit meaning sclerosis or hardening of arteries but closer consideration would show that it is really an ambiguous and confusing term applied to at least four pathological arterial conditions, *viz.*, (*a*) chronic arterities, *e.g.*, syphilitic, (*b*) atheromatous changes, (*c*) Monckeberg's degeneration, (*d*) myohypertrophy or diffuse hyperplastic sclerosis, an essential change in high arterial pressure.

Systematic studies of the evolution of arterial changes have shown that as a part of the response of the body to increased functional demand which operates chiefly throughout early youth and adult life, hypertrophy and hyperplasia of the elements of the tunica media and tunica intima take place, and the process continues till a certain age period not exceeding 40. After 40 further strengthening of blood vessels occurs by deposition of non-elastic fibrous connective tissue in the intimal coat at the points of weakness. These weak spots are possibly in the middle coat, and are accounted

for by a diminished blood-supply *via* the vasa vasorum, a result of infection or intoxication in advancing age. The thickened intima gets less nutrition in its deeper portion from the circulating blood by diffusion and may undergo hyaline degenerative changes. In addition, lipoid bodies may appear in the interstices of separated fibrous tissue layers free or inside mononuclear cells.

The sequence of events as described above represents the probable stages of what is known as the atheromatous process or what Marchand (1904) termed as "atherosclerosis", though no single explanation regarding the source of the lipoids and the actual pathogenesis of the condition is still unanimously agreed upon. Incidentally, it is the commonest variety of arteriosclerosis.

Atheroma, a term first used by Galen to signify a swelling full of gruel-like material, begins as small fleck-like areas raising slightly the inner surfaces of the aorta and other important vessels like the coronaries, cerebral, and the branches, supplying the extremities and later encroaching a little on the lumen. These areas tend to increase in size and number colouring the vascular intima yellow, and may extend to the mitral and aortic valve-cusps. Histologically, the initial process is a deposition of fat in the end-arterium with subsequent reactionary fibrosis or secondary deposition of calcium salts resulting in a stiffening of the artery or sclerosis. The rigid and inelastic blood vessel may be a handicap to the circulation while a breaking down or ulceration of the calcified plaques may predispose to thrombus formation and embolism. An associated degeneration of the media might be responsible for dilatation of the aorta, localised or diffuse.

Attempts at determination of the etiological factors and pathogenesis of arteriosclerosis have resulted in a bulk of work of which only a brief discussion can be made in the present instance. There are three important theories in vogue regarding the pathogenesis of atherosclerosis:—

(1) The first theory was championed by Virchow (1856) who believed the process to be partly infectious and spoke of an "endarteritis chronica nodosa deformans." The infectious process altered the wall of the vessel so that imbibition of fat from the serum of the blood stream followed and fat was deposited there.

(2) Next comes the degenerative theory sponsored by Marchand (1904), Jores (1924), Aschoff (1924) and others. The primary degeneration, according to Thoma, is in the media followed by a compensatory proliferation of the intima. Marchand and Jores, however, believed it to be a primary degeneration of the intima. Aschoff subsequently showed that the source of the fat was an infiltration from the nutrient blood-plasma, an original concept of Virchow.

(3) It was Aschoff (1910) again who proved that the fat deposit consisted of cholesterol esters, the same as are present in the blood stream. His explanation which was experimentally verified by feeding cholesterol to rabbits, is responsible for regarding cholesterol metabolism as the chief governing factor in atherosclerosis.

Rosenthal (1934) after an investigation (in collaboration with Aschoff) came to the conclusion that the deposit of lipoids is closely related to the structure of the vessels, and to the infiltration and expression of fats. "The infiltration is dependent on the cholesterol in the serum, the blood pressure, and the nature of the limiting membranes, while the expression of lipoids is dependent on the nature of the elastic barriers, the width of the intima and the inequality of the contracting parts". Age alone, according to Rosenthal, may lead to a senile sclerosis of the aorta, but not to atherosclerosis.

"Experimental cholesterol arteriosclerosis" (a term used by Duff in 1934) has provided us with many important data regarding the pathogenesis of atherosclerosis. Cholesterol administration and hyper-cholesterolæmia are essential factors in the experimental development of atheroma (in rabbits). But the scattered distribution of the lesions calls for a third factor which possibly acts locally. This element, according to Duff, sets up local conditions of the nature of arterial injury favouring the precipitation of the lipoids. The identity of this factor, which is possibly not the same in all instances, is still undecided. It may be just stress and strain (Klotz, 1906) or bacterial infection (Benson, Smith *et al*, 1931) or endocrine influence (Danish, 1928) or some other factor yet to be evolved. The lesions caused by experimental cholesterol feeding and those found in human arteriosclerosis, differ in many respects both anatomically and histologically and, in fact, Duff uttered a note of caution when he said that their etiology and pathogenesis might not be exactly or even nearly identical and that the etiological factors common to both experimental and human diseases might not operate with equal intensity in both instances.

Material for Investigation

Investigation for determining the etiological factors of atherosclerosis have uptill now been carried out by European and American workers mainly, and their field of work was limited to their own country. Evidently, whatever conclusions they might have drawn as regards the pathogenesis of atherosclerosis apply to their own people whose genetic make-up, social and economical factors are widely at variance with those of people in this part of the world, particularly in India. Essentially a tropical country, India has her different provinces with different environmental and other factors which account for variation in the physical build of the people, *e.g.*, the Bengalees and the Punjabis. Distinction also exists regarding standards of life amongst the rich and the poor, as well as among the rural and the town-folk. All these facts have got to be taken into consideration while calculating the bearing of nutrition and diet on the incidence of atherosclerosis.

No first-hand information on the occurrence and causation of atherosclerosis being available in our country we decided to make a preliminary study of records of

autopsies done in the Medical College Hospitals during the period 1900-1940 and obtained the following data:

Total number of autopsies (excluding partial ones) done in this period were 4,062 of which 851 cases *i.e.* 20·9 per cent showed gross atheromatous lesions. We are presenting our data below in a tabular form with preliminary remarks only. The significance of these findings will be fully assessed in the discussion which follows.

1. Tables 1 and 2 show the incidence of atherosclerosis according to religion and race, and age respectively:

TABLE 1—SHOWING THE INCIDENCE OF ATHEROSCLEROSIS ON RELIGIOUS AND RACIAL BASIS.

	Male	Female	Total
INDIANS			
Hindus	468	114	582
Muslims	131	11	142
Anglo-Indians and Indian Christians ..	49	14	63
EUROPEANS ..	52	8	60
OTHERS	3	1	4

TABLE 2—SHOWING THE INCIDENCE OF ATHEROSCLEROSIS ACCORDING TO AGE.

Age	*1—10*	*11—20*	*21—30*	*31—40*	*41—50*	*51—60*	*61—70*	*71—80*	*81—90*
Hindu Male	1	18	91	172	115	59	8	3	1
Hindu Female	1	6	31	30	22	20	2	2	0
Muslim Male	0	10	31	44	21	15	8	2	0
Muslim Female	0	0	2	4	3	1	1	0	0
A. I. & I. Ch. Male ..	0	0	11	10	10	12	4	2	0
A. I. & I. Ch. Female ..	0	0	3	2	2	4	2	1	0
European Male	0	0	6	9	18	9	8	2	0
European Female	0	0	1	1	1	3	2	0	0
TOTAL ..	2	34	176	272	192	123	35	12	1

2. *Sex*: The following figures show the incidence according to sex:

	Indians	*Europeans*
Males ..	648 (82·3 p.c.)	52 (86·6 p.c.)
Females ..	139 (7·7 p.c.)	8 (13·4 p.c.)
	787	60

3. *Build and Nutrition*: Unfortunately, no regular and systematic record in this respect is available and only a rough idea can be obtained from the observations regarding the state of nutrition of the bodies. In this series it was recorded in 509 cases which have been classified into 3 groups:—

Good nutrition	118
Fair nutrition	134
Poor nutrition	257

General appearance and weight of the patient in relation to age were usually taken into account for this purpose.

4. *Causes of death*: Causes of death of the patients, in this series, can be classified as follows:

Heart disease	
A. Hypertensive	21
B. Others, including rheumatic, syphilitic, anæmic and bacterial endocarditis ..	108
Cerebral vascular lesions	32
Chronic nephritis	76
Diabetes mellitus	4
Tuberculosis—pulmonary and non-pulmonary ..	101
Miscellaneous	509
	851

5. *Vessels involved*: The post mortem records do not give exhaustive notes of examinations of all the big arteries of the body as we would like to have for this investigation. We could, however, gather the following facts from the available records.

Aorta	835	cases
Pulmonary artery ..	47	cases (of which in 16 cases the lesions were only in the pulmonary artery).
Coronaries	48	cases
Cerebral	19	cases

For the study of the problem at issue the following tables showing the details of the lesions in the aorta will be interesting:

Sites of lesions in the aorta:

Root	384
Root and arch	30
Root and thoracic aorta ..	19
Root and abdominal aorta ..	13
Root, arch, thoracic aorta ..	2
Arch of the aorta	24
Arch and thoracic aorta ..	5
Thoracic aorta	35
Thoracic and abdominal aorta ..	7
Abdominal	20
General (no specific mention of site)	205
Throughout	91
	835

Degrees of lesions:

I.	Early streaks	401
II.	Fair numbers of plaques ..	315
III.	Calcification	49
IV.	With ulceration ..	70
		835

Aneurysmal dilatations:

Root	11
Arch	6
Thoracic aorta	2
Abdominal aorta	1
Root and arch	1
Root and thoracic	3
	24

6. *Changes in the heart*: Incidence of gross changes in the heart, (hypertrophy and dilatation) are given below:

Hypertrophy of left ventricle only (thickness more than 14 mms.) ..	183 cases
Hypertrophy of right ventricle only (thickness more than 5 mms.) ..	28 cases
Hypertrophy of both ventricles ..	48 cases
Dilatation of the heart in general ..	38 cases

7. *Gross renal changes* either associated, cause or result (of varying degrees) 427 cases

Discussion

The figures obtained from *post mortem* records as detailed above supply us with data which can be considered in their relation to the causation of atherosclerosis.

Age—Among the Indians in the series, the maximum incidence was in the fourth decade of life, *i.e.*, between 31 and 40, there being 272 cases or 34·6 per cent out of a total of 787. Amongst the Europeans in the series the largest incidence was between 41 and 50, there being 19 cases out of 60, *i.e.*, 31·6 per cent.

The youngest subject in our series was a female child aged 4 years who died of bronchopneumonia with purulent pericarditis and showed atheromatous streaks just above the aortic valve-cusps.

Atherosclerosis has been generally designated as a disease of advancing age (Dible and Davie, 1939), degenerative changes beginning in the aorta after 40. This observation is borne out, in the present instance, by the maximum age incidence among the Europeans but it is definitely earlier in onset among the Indians.

Sex—Incidence of atheromatous changes was much higher in the male sex than in the female, but it may be partially accounted for by the fact that lesser number of female subjects are autopsied in comparison with males.

Diet and standard of life—No observations were made in the post mortem records as regards diet, but judging from the class of people who ultimately come to lie on the autopsy table, we can safely conclude that they had a very low standard of living, as most of them have none to care for them or even to claim their bodies for disposal after death. In fact, very poor people and street beggars constitute the major percentage of the subjects for autopsy. Mention of nutrition made in some of the cases is, as already stated, based on naked eye view of the body.

Blood pressure—Clinically, hypertensive heart disease was the cause of death in 21 cases only, *i.e.*, 2·5 per cent of the total number. Chronic nephritis and cerebral vascular lesions accounted for 76 *i.e.*, about 9 per cent and 32, *i.e.*, 3·8 per cent of the total number of cases respectively. Assuming that hypertension was also associated with these, total number of cases having high blood pressure comes to 129 that is 15 per cent.

Changes in the heart—A left ventricular hypertrophy was found in 183 cases or 21·5 per cent, whereas hypertrophy of both ventricles was present in 48 cases or 5·6 per cent. Valvular lesions were responsible for the hypertrophy in a number of cases. All the cases of primary pulmonary atheroma (16 in all) were associated with right ventricular hypertrophy.

Probable etiological factors—The chief known contributory factors leading to atherosclerosis have been almost unanimously recognised to be age, diet (in relation to cholesterol content of the blood) and blood pressure. How far these elements apply to our country has not yet been decided upon, and only a theoretical consideration is possible at the present stage.

The hypertrophic, hyperplastic development of the aortic intima is a physiological response during growth, reaches its peak, according to Aschoff (1933), at about 33 years. From there on there is possibly a stationary period until 45 years, after which degenerative changes begin. The difference between these two stages of life, ascending and descending, is also borne out by the increase of fat content of the aorta in a regular progression with age as determined by Rosenthal who ingeniously expressed the value in terms of a "fat angle of the aorta" or inclination to atherosclerosis. Apparently lipoid deposits also occur in youth perhaps in the same sites as the atherosclerotic lesions, but these are not uniform (Zinzerling, 1925) and are small in amount. It has been shown that the structural alteration in the abdominal portion of the aorta with age are responsible for the greater incidence and severity of atherosclerosis there, while in youth lipoids are deposited more in the thoracic portion of the aorta.

In the present series we have already pointed out, an earlier age incidence of atherosclerosis even on gross examination and this has to be explained, according to Aschoff's view, by early degenerative changes in the aorta, which may be possible in the tropics. The site of maximum incidence, however, was found to be the root of the aorta (that is, the portion just above the valve cusps) which was the only part involved in 384 cases out of 835, *i.e.*, about 46 per cent. Strangely enough this observation corresponds to that of experimental cholesterol arteriosclerosis (Duff, 1934).

The fat content of the aorta was found by Rosenthal to be directly proportional to the severity of atherosclerosis. The fact tentatively supported the very widely accepted view of cholesterol metabolism having a great part to play in the pathogenesis of atheromatous changes. This takes us over to consider the dietetic problem in greater details.

It has been proved that hypercholesterolæmia and also hyperlipæmia precede the development of atheromatous lesions in the rabbit's aorta in cholesterol feeding experiments. Similarly, in certain diseased conditions like diabetes mellitus, and lipoid nephrosis, a state of hypercholesterolæmia exists, and acting for a long period tends to increase the inclination to atherosclerosis of the aorta. These observations raise the question whether hypercholesterolæmia also precedes atherosclerosis in the average normal individual. Being a blood lipoid, cholesterol is derived from the fat in the food and an usual high fat diet may possibly cause a persistent increase in the cholesterol content of blood, and predispose to atherosclerosis. Evidence in favour of this statement is offered by the high incidence of atherosclerosis among the Americans and the British people (Majors and Rogers, quoted by Rosenthal), and the marked decrease in central Europe following the war when the intake of fat was low (Aschoff).

Against the hypothesis put forward in the last paragraph there is a lot to say and consider. Total cholesterol of blood has been found to be the least variable lipoid constituent of the blood. The concentration of fat in the blood rises for a few days if individuals are fed on high fat diet deficient in other food constituents, but then gradually returns again to a normal level. This increase is in the fatty acid group (Wilson and Hanner, 1934) and cholesterol is not markedly involved (Bloor, 1921). Campbell (1925) has suggested that durable increases of blood fat result, not when more fat enters the body to be burnt or conveyed to storage centres but when there is a continuously greater demand for fat as fuel, because of the absence of available carbohydrate—a condition occurring in diabetes mellitus.

The latter observation is largely supported by the fact that Roger (1925) reported the incidence of atherosclerosis in Bengalees to be similar to that in England though they eat a diet low in protein and fat but high in carbohydrate. With a similar diet the Southern Chinese have a lesser incidence (Foster quoted by Rosenthal). We do not know, however, whether the same thing can be said about the other provinces of India.

The normal blood (plasma) cholesterol content of our people has been claimed to be 90·6 to 150 mgms per 100 c.c. by Majumdar (1942) and 120 to 160 mgms by Bose and De (1936)—distinctly lower range than European figures. Figures obtained from standard European and American literature are much higher *e.g.* according to Bloor (quoted by de Wesselow), the average cholesterol content is 220-240 mgms per cent; according to van Slyke *et al* the figure is 232 mgms per cent; according to Wright, the range is 150-200 mgms per cent. Apparently, plasma cholesterol content has a lower value in our country though Bose and De state that it does not differ materially from the standard European and American figures.

Suggestion might be made as to the possibility of a greater incidence of diabetes mellitus, manifest or latent, in our country particularly in Bengal. But an authority like Joslin has stated that a high percentage of carbohydrate in the diet does not appear to predispose to diabetes mellitus. In fact, he says, the Japanese living largely upon rice and barley show a less frequent and milder type of the disease. Adoption of Western diets among the wealthy and leisured classes is said to be responsible for the disease. We have no statistics to challenge Joslin's opinion but can only say that diabetes mellitus is quite frequent among the middle class people as well, and that heredity and mental worries play a great part in its causation.

Anyway, of the 851 cases in our series there were 4 cases of diabetes mellitus and we do not expect to get many as, we have mentioned before, the subjects belonged to the poorest class. Neither can we expect that they had lived on high fat diet and had high blood cholesterol values. On the other hand malnutrition being the dominant feature, the average blood cholesterol can be assumed to have been a lower figure. It must have been so, particularly in 101 cases, who died of tuberculosis—pulmonary and non-pulmonary, a condition where hypocholesterolæmia is said to exist (Rosenthal).

The ardent supporters of the "hypercholesterolæmia" theory of atherosclerosis may argue that owing to a lack of uniformity in the method employed and in the preparation of the patient, the "normal" blood cholesterol value shows variations from 85 to 310 mgms per 100 c.c. (Bang, Bloor methods), surely too high a variation, but a consideration of the question as put forward in the present paper would cast a shadow of doubt on the existing idea of hypercholesterolæmia producing atherosclerosis.

What change actually occurs in the cholesterol metabolism with the advance of age is not exactly known, whether it is a relative increase in the blood cholesterol or an accentuation of digestive lipæmia or some other form of disturbance is yet to be determined and herein lies perhaps the clue. There are people who have even reported a decrease in blood cholesterol in older persons. It should be borne in mind that there are other conditions also influencing the cholesterol metabolism and these may be endocrine disturbances, damage to the reticuloendothelial system and other systemic diseases. Experimental cholesterol arteriosclerosis is accelerated by castration (Lowenthal, 1926), thyroidectomy and splenectomy (Shapiro, 1927) and administration of posterior pituitary extracts (Moehlig and Osivs, 1930) and we do not know whether such influence is exerted by the gonads and reticulo-endothelial system on the development of atherosclerosis in human beings.

Regarding the role of cholesterol we would like to concur with Rosenthal that "in adult persons, and more particularly in the descending stage of life, the aging of the colloids as well as the decreased elasticity of the vessel favour a binding or precipitation of the lipoids as well as a decreased expression of the same with the resultant irreversible cholesterol deposit." We would add that premature atherosclerosis in particular, and the diffuse deposits of lipoids in the vessel wall raise the question of arterial injury which was so aptly pointed out by Duff.

The part played by hypertension can be summed up as facilitating the production of atherosclerosis though atherosclerosis and hypertension are not synonymous. In essential hypertension and glomerular nephritis the inclination to atherosclerosis is high. Increased pulmonary tension has been unanimously recognised as the only known factor in the production of a pulmonary atheroma which presents a slightly different problem requiring elucidation.

It would be seen from the above data that out of four thousand autopsies, in 20 per cent of cases we got atheromatous lesions. When we come to the condition of the coronaries, we find that only 48 cases *i.e.* a little over one per cent, have been involved. But this is not a correct picture of the incidence of atheroma in the coronaries because we find the coronaries were not systematically investigated from this point of view. We have, however, taken up the routine investigation of coronaries and our observations on them will be recorded later on.

Conclusions

The natural conclusion we arrive at, is that the atheromatous process is possibly dependent on the cholesterol content of the blood but hypercholesterolæmia is not the final governing factor in its pathogenesis specially in our country or rather in Bengal. A disturbed cholesterol metabolism occurring as early as the 4th decade of life and resulting in a binding down of cholesterol in the end-arterium is a more plausible cause, and this disturbance may be related to the functions of the reticuloendothelial system, of the endocrine organs, and infections and other systemic diseases. Arterial injury caused by factors yet unknown is probably responsible for the scattered distribution of the lesions.

Summary

(1) A short discussion on the works done for determining the etiological factors of atherosclerosis has been given in the introduction.

(2) A statistics prepared from autopsy records in Medical College Hospitals, Calcutta, during the 40 years period (1900-1940) has been given showing certain significant data with bearing on the pathogenesis, distribution and effects of atheromatous lesions.

(3) Etiological factors of atherosclerosis and existing idea regarding its causation has been critically discussed in the light of conditions prevalent in Bengal.

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RUPTURE OF THE UTERUS

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Introduction

Rupture of the uterus is one of the serious accidents that can come up before an obstetrician, and if not recognised early is almost invariably fatal. One of the main reasons of fatality in these cases still remain the lack of antenatal care. Beck (1935) is of opinion that "when maternity care is of low grade and complications are neglected, the uterus may repture as often as once in every 500 labours." Due to lack of proper statistics in this country, it is very difficult to come to any definite conclusion regarding the incidence of the accident. In the Shree Sayaji General Hospital, the author had the opportunity to see quite a number of cases during the last five years and thinking that a presentation of these cases will stimulate others to do better work extending for several years to come to the detailed knowledge in the subject, this communication is presented. Before discussion of the subject, the author would like to present the following case records:

Case Reports

Case 1—A case of ruptured uterus with spontaneous recovery—C., a Hindu female, aged 21 years, second para with the history of difficult labour in the first pregnancy was in labour for three days. A native *dai* was attending her. After three days when the patient could not be delivered, she advised her relatives to take her to the local dispensary. The doctor-in-charge of the dispensary and the nurse did both the internal and external examinations and gave her 1 c.c. of pituitary extract, after which the pain stopped. She was, thereafter, brought to the Shree Sayaji General Hospital, Baroda, on the evening of the 23rd April, 1935. *Condition on admission*—Pulse 160 per minute; resp., 44 per minute, temp., subnormal. The patient showed signs of collapse. Abdomen was distended, rigid and tender. *Presentation*—Vertex was seen deep in the vagina. Fœtal heart sound could not be heard. *Provisional diagnosis* was of rupture of the uterus. *Treatment*—Catheter was passed with great difficulty. Urine full of blood came out. Craniotomy was performed. The placenta did not come out, so it had to be removed manually. While doing the same, a big irregular rupture was found in the anterior wall of the uterus. The bladder was completely separated from the uterus, the anterior fornix was completely torn and the placenta was found outside the uterus, lying free in the abdominal cavity. It was removed. There was slight bleeding from the uterus. The uterus and the vagina were firmly plugged with gauze. After 24 hours the plug was removed and a fresh light pack was put into the vagina for two successive days, to prevent the intestinal exposure and to allow the adhesions to form. The patient was in a state of severe shock since her admission to the hospital and did not know what happened to her for three days. The adbomen was distended. She started complaining of shooting pains in the abdomen. The patient passed through all the complications of septic delivery such as pelvic and general peritonitis and high fever and other attendant events, and to our great surprise she began to show a very good progress under the antiseptic treatment. After one month and five days she was discharged from the ward in an improved condition. At the time of discharging her from the hospital the condition of the uterus could not be known as an internal examination was not advisable. She was advised to come for examination after three months. *Subsequent progress of the case*—The patient came after four months. On an examination per vaginum, the vagina was found full of adhesions, and could admit only the tip of one finger. Inflammatory masses were also felt per abdomen. She was asked to call again after six months but she actually came after one year. At that time the adhesions in the vagina had almost cleared except a circular septum. The patient was having menstruation regularly, the old pelvic inflammation was less, but was still present. On the 25th August, 1940, she was again admitted into the hospital for delivery. She had promontory +, with the history of the rupture of the uterus in her last delivery. We did Cæsarian section on her on the 27th August, 1940. There were many adhesions round about the uterus and both the tubes, and, as her general condition was not satisfactory for a prolonged operation, we could not get her sterilized. A big scar of old unstitched rupture was seen in the anterior wall of the uterus at the time of operation. Both mother and baby were discharged well on the 25th of September, 1940. The patient was again admitted into the hospital for delivery on the 28th August, 1942. (This time she was attending the antenatal clinic attached to the hospital fairly regularly.) Her general condition was satisfactory. Her pelvic measurements were: I.S.—8″, I.C.—9″, Ext. Conj. 7″, high promontory. Caesarian section was performed under spinal anæsthesia. All the adhesions round about the uterus and tubes were found clear. So the patient was sterilized. The mother and baby were discharged well on the 19th September, 1942.

Cases 2, 3, 4—These cases are grouped together as all of them were septic due to bad handling by native *dais*. These were treated on conservative lines: plugging and general antiseptic treatment. After the usual septic consequences, fever, peritonitis and other incidental happenings, all of them rallied and were discharged cured.

Cases 5, 6, 7, 8—Four more cases of ruptured uterus were taken by us. These cases came very early and the conditions of these patients were not good. These were severely shocked. But as the patients went down-hill, we wanted to take a chance and we decided for immediate operation for suturing the tear but the patients died within six hours of the operation.

Case 9—A case of gradual rupture of the uterus—S. D., female, aged 28 years, multipara, was admitted in

the maternity ward on 14-7-41. She was being attended by a *dai* and gave history of slight bleeding from the vagina for the last fifteen days. *Condition on admission*—Pains were slight, F.H.S.(?), slight bleeding per vaginum. Pulse 99 per minute. temp., 98°, resp. 22 per minute; Hb. 55%. She did not deliver till the 2nd day. On P. V. examination, the uterus was felt well contracted at the back of the ovum. The anterior fornix was torn. A sack of the ovum was felt through the vesicouterine pouch. Diagnosis of rupture uterus was made and the abdomen opened. A complete sack of the ovum was found free in the abdominal cavity coming out through the anterior wall of the ruptured uterus. There was an irregular tear through the uterovesical pouch, opening into the vagina. The sack was opened and the child was removed. The placenta and membranes were removed. The placenta was adherent to the anterior wall of the uterus. The uterus being very irregularly torn and as there was much bleeding from the right uterine artery, subtotal hysterectomy was performed after ligaturing the uterine arteries. The abdomen was then closed and a piece of gauze was left in the abdominal wound for drainage for 24 hours, as the case was septic. There was a lot of discharge from the wound but there was no fever. The patient was discharged cured on 11-9-41. The baby was still-born. Cases of gradual rupture of the uterus are rare, so this case is described here Except slight blood discharge for fifteen days the patient showed no other signs of rupture of the uterus. As she did not deliver after 24 hours of admission P. V. was done and the rupture of the uterus was detected accidentally.

Discussion

Rupture of the uterus has been discussed in literature under three heads: (1) rupture during pregnancy, (2) rupture early in labour, (3) rupture after prolonged labour. In the cases reported in this communication, none can be grouped under the first category. Majority of the cases belonged to the third group and only one case can be classed under the second group.

All the cases reported here were due to mishandling during labour, and the problem remains a menace in our country, as very little advancement has been made in the maternity services. Indigenous *dais* still meddle with our obstetric cases with consequent obstetric traumas, many of which lead to rupture. The cause of death in those cases, which we could not save can be summarised as follows:

(1) The patients were generally in a severely shocked condition and were not in a position to bear the shock of operation.

(2) The rupture was accompained with internal hæmorrhage.

(3) While transporting from distant places to the City Hospital they were more exposed and shocked.

(4) The cases were almost always septic as they were, in many instances, badly handled by *dais*.

(Continued at foot of next column)

CAUSAL TUBERCULOSIS

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At the end of the first article on Causal Tuberculosis, which appeared in the February number of this Journal, Dr. Cruickshank, of the Research Staff at Papworth, was quoted as saying that the death-rate due to tuberculosis had begun to fall before the institution of anti-tuberculosis campaigns and that it had continued to fall at a practically constant rate since, quite uninfluenced by these campaigns and the spread of enlightened methods of treatment and prevention. Hence an unknown cause has to be sought for the fall in place of those, to which the medical profession commonly attributes it and for which they claim merit.

Cruickshank himself has presented such an hypothetical cause, the conception of which originated out of the contemplation of the following three points: (1) the steady decline in the death-rate, apparently independent of any known external factor, (2) the need to look for

(Continued from previous column)

Here the author would like to bring to the notice of the profession, a peculiar practice of the *dais*, the practice of "kallo."

The practice of kallo—When the patient is having false pains and is not in real labour some of the native *dais* practise what is known as *"kallo."* This consists of heavy knocks on the abdominal wall in their premature attempts of delivering a baby. The result is rupture of the uterus due to trauma. The uterus is always very badly torn. The baby comes out of the uterus into the abdominal cavity. The presenting part is now in the anterior or posterior fornix of which they are not aware. They continue with their knocks (kallo) and ultimately one of the fornices is torn, through which the presenting part is pushed down into the vagina. When any abnormal part presents through the vagina they get frightened and then refer the cases to the hospitals.

The last case brings about an interesting point of fact. Here all the signs and symptoms of the rupture were absent and the rupture must have been very gradual with very little loss of blood and shock and the rent was discovered accidentally.

Treatment—The treatment in these cases had been both expectant and operative. When the patient comes to the physician late as in the first case, the hazards of an abdominal operation can hardly be faced, and in such cases we had no other way but to resort to an expectant procedure. Luckily enough, we had rather good results with this treatment. But immediate operation still remains the method of choice in suitable cases.

Reference

Beck, A. C. (1935)—Obstetrical Practice, p. 564, Balliere, Tindall & Cox.

some unrecognised force at work like to that which determined the decline in chlorosis, (3) the observation that certain children of tuberculous stock fail to succumb to infection, while possessing perfect teeth, whereas x-ray will reveal signs of tuberculosis if dental decay sets in.

What gives sound teeth to children? Amongst several factors, raw milk is prominent. Cruickshank, pondering on the raw milk factor, put together the history of raw milk with that of the decline of death-rate in tuberculosis in Great Britain to see if there was any fact that could connect or correlate the two. The search led to one fact of significance in the history of raw milk. That fact was the introduction of the galvanised iron milking pail in place of the older pail of wood. In the older pail the milk came in contact with wood, in the new it came in contact with galvanised iron.

We are now led into the fascinating field of the influence of the presence of 'trace elements', minute amounts of certain elements, upon animal and vegetable health. As examples of trace elements is the anæmia, from which rats, fed only on milk and refined cereal, eventually die, and which has been found to be due to the absence of traces of copper; the incurable disease of sheep in certain parts of Australia and New Zealand, in which now a quick cure can be effected by a milligramme of cobalt a day in a sheep that is a bag of bones and doomed to almost immediate death. In the vegetable world there is the need of oats for a trace of manganese, and of sugar-beet, turnip, alfalfa and other plants for a trace of boron; sugar-beet, for instance, is destroyed by heart rot, but thirty pounds of boron per acre will ensure a healthy crop. There are many further cases of suspected trace element, but the difficulty of proof in dealing with minute amounts is considerable.

Can it be that there is a trace element concerned in the etiology of tuberculosis and can zinc be such a trace element? Is that the secret of the pails? To find some answer to this queston, Cruickshank suggested to himself four paths of enquiry in answer to four questions.

The first path started from the question: Has zinc any physiological significance? Zinc is widely scattered in the crust of the globe and is in certain regions concentrated. It is present in all the organs of mammals, in numerous reptiles, amphibians and insects, in marine animals, and it is almost universally present in vegetable life. Experimental deprivation of zinc in animals and plants leads to various forms of defective growth. In human beings no such experiment has been made nor is likely to be made. Nevertheless, in spite of this slender knowledge, Mr. Bacharach (Science and Nutrition, 1938) states that it is highly probable that zinc will be found to have an essential role in the metabolism of the human being, though up to the present experiment has not revealed any such role.

The second path arose from the question: Does the date of the introduction of zinc ware correlate with the death-rate curve of tuberculosis? The answer to this is very remarkable, so remarkable in fact as to start the whole enquiry. The first zinc factory in England was opened in Bristol in 1740. In the year 1837, Mr. H. W. Cranford for the first time manufactured 'galvanised iron', which is iron coated with zinc, from which non-rusting pails and other receptacles were made. Correlating these facts with the tuberculosis death-rate, that master of statistics, the late Professor Karl Pearson, showed that the death-rate from phthisis increased steadily as one went back to the year 1938, and Mr. Arthur Ransome would track it back as far as 1743 (Bristol factory, 1740). A further evidence of a correlation between galvanised iron receptacles and the tuberculosis death-rates has occurred in countries where zinc has been made available by manufacture, namely the United States, Great Britain, Germany, Belgium, Holland, Australia, whereas in countries where this has not been so, in Ireland, Norway, Sweden, Serbia, Rumania, Hungary, Spain and Portugal, mortality has increased or only slightly declined. Finally, under experiment, female animals have been found to be more susceptible to zinc deficiency than males. Statistics show that the decline in mortality from tuberculosis has been more marked in human females than in males. These points lead to the second question being answered definitely in the affirmative.

The third path arises from the question as to whether animals, resistant to the human bacilli, show a world distribution in any way associated with a zinciferous soil. Cruickshank investigated the present and the past distribution of three resistant animals, the highly resistant goat and rat, and the resistant rabbit. Goats, rats, and to a less extent rabbits appear to have had their centres of origin in regions comparatively rich in zinc, whereas the centres of susceptible animals, guinea-pigs, monkeys, antelope and elephants, lie outside zinciferous regions.

The last question is: Is zinc of any therapeutic value in the treatment of tuberculosis? Zinc oxide is used for night sweats, zinc ionisation is used in some cases of surgical tuberculosis, the old-time remedy of codliver oil has a high content of zinc.

Of the four paths, numbers two and three are notable indicators, numbers one and four do not oppose them and may be said to give them a slight support.

The great merit of this work, which has been carried out mostly during the supervision of the late Sir Pendrill Varrier Jones, to my mind, lies in the width of its vision. Like all the Papworth work of Sir Pendrill, it takes within its survey aspects, which are commonly beyond the ambit of professional investigators of tuberculosis, for example a correlation with the history of the death-rate from tuberculosis. Above all it relates the tuberculosis to a possible defect in the soil and the foods that are got from it or a defect in the use of the same. In this way it associates itself with the miracle that was brought about on the estate of Hohenlohe and which was due to the substitution of the rightly grown food for the wrong. It is this relation to the source of life that brings with it a new hopefulness. Nevertheless, at its present stage, it is only what its author calls it—an hypothesis.

MEDICAL PREPAREDNESS SERIES

The war coming on to the borders of India has revealed to us all the terrible aspects of the menace and it has become apparent that the profession shall have to take up quite a large share of responsibility in A.R.P. measures. A series of articles on war medicine, A.R.P. and allied subjects is being published with the idea of helping the cause of necessary medical education. This is the second article of the series.—EDITOR, *J. I. M. A.*

BLOOD TRANSFUSION

N. C. DAS GUPTA, M.B., *Khulna*

HISTORICAL

Blood as a therapeutic agent has been tried since the dawn of civilisation. In ancient Egypt human blood was used as bath to invigorate blood supply. A more rational and scientific use may be found in Ayurveda where man has been grouped mainly into four different types (constitutions) according to the predominance in his system of any of the four different types of blood recognised by Ayurveda, *viz., Vata, Pitta, Shlesma* and *Raktasuddham* (in which all the elements are equal). In Europe transfusion was revived in the seventeenth century A.D. after Harvey's discovery of the circulation of blood. The idea first occurred to Sir Christopher Wren, who in 1646 tried it unsuccessfully with two quills connected with a bladder. The first transfusion was given by Richard Lower in 1665 from one animal to another of the same species. Denys de Montpellier, physician to Louis XIV was the first to perform it in man in 1666. But owing to numerous accidents following the operation it was banned in England and France, and not before a century and a half was it revived in 1818 by James Blundell of Guy's Hospital, who injected human whole blood in a case of postpartum hæmorrhage with phenomenal success. In 1835 Bischoff first introduced defibrinated blood for transfusion. The scientific foundation of blood transfusion was, however, laid in 1900 by the discovery of iso-agglutinins and iso-agglutinogens in the blood by Landsteiner an Austrian biochemist.

PRINCIPLES

Blood transfusion is extensively used in modern medicine for the following conditions: (1) To restore the volume of blood, either lost by hæmorrhage or stagnated in the capillary bed, *e.g.,* in surgical shock, burns. (2) To supply adequate amount of oxygen-carrying hæmoglobin to the system *e.g.,* in anæmia or hæmorrhage. (3) To add leucocytes and immune bodies *e.g.,* in septicæmia. (4) To increase the hæmostatic bodies: platelets, prothrombin in cases of hæmorrhagic diseases.

But before we can actually decide on blood transfusion, we must consider a few fundamental things:

Blood groups—Human red corpuscles contain mainly two kind of agglutinogens (antigens) A and B, and the serum corresponding agglutinins (antibodies) and β. These agglutinogens and agglutinins may exist in the blood either singly or in combination. Evidently, an agglutinogen cannot exist along with its corresponding agglutinin, for there would be agglutination. On this basis human race can be divided into three groups, *viz.,* AB, A and B. The group A may contain the agglutinin β but not α; similarly, group B may contain α but not β; and AB can contain neither α nor β There is a fourth group of people in which none of these agglutinogens is present—the cypher or O group. This group, however, contains both the agglutinins.

For this knowledge of individual serological differences and the definition of four classical groups on the basis of these differences we are indebted to Landsteiner, von Decostello and Sturli. These groups are also known by the numericals I, II, III and IV originally introduced by Moss and Jansky (1907-08). The alphabetical groups introduced by the Health Organisation of the League of Nations are known as *International Nomenclature.* Although the Moss system is followed in many hospitals, the international one is now followed universally in scientific work. The following table gives the relation of International and Numerical blood group nomenclature:

International	*Moss*	*Jansky*
AB	I	IV
A	II	II
B	III	III
O	IV	I

Distribution of agglutinogens and agglutinins in the different blood groups is shown in the following table:

Group	*Agglutinogen in R. B. C.*	*Agglutinin in serum.*
AB	A & B	0 (zero)
A	A	β
B	B	α
O	O	α & β

It will be evident from the above that if blood of certain type of people is mixed with serum of certain other type there would be agglutination while in the other instances there would be none. For example, if blood of AB is mixed with serum of A there would be agglutination owing to the presence of agglutinogen B in the former and its corresponding agglutinin β in the latter; whilst if blood from A is mixed with serum from AB there would be no agglutination. The following table shows the reaction of red cells and serum of different blood groups.

Serum of group	*Agglutinin in serum*		*R.B.C. of group*			
			AB	A	B	O
AB	—	—	—	—	—	—
A	—	β	+	—	+	—
B	α	—	+	+	—	—
O	α	β	+	+	+	—

"+" Signifies agglutination of R. B. C.
"—" Signifies no agglutination of R. B. C.

On these serological differences and classification of blood groups rest the principles of blood transfusion. Previous to the adoption of this scientific and accurate method of blood grouping, transfusion very often resulted in such serious consequences as hæmolysis, violent reaction and even death. Therefore, whenever possible blood for transfusion should be taken from a donor of the same group as the

recipient. It may, however, be taken from any donor whose red corpuscles are not agglutinated by the serum of the recipient. And although it is dangerous to transfuse a blood whose red corpuscles are agglutinated by the serum of the recipient it is permissible to do it in a case where the red corpuscles of the recipient are agglutinable by the serum of the donor. For it is contended that the serum of the donor is rapidly diluted by that of the recipient and practically no agglutination occurs.

From the table it will be seen that the blood of AB Group contains no agglutinin and can receive blood from every other group; hence this group is called the "universal recipient." And since group O contains no agglutinogen it can donate blood to every other group, and is called the "universal donor."

Obviously, therefore, the success of transfusion depends mainly, if not entirely, upon the selection of the donor. Of course, there are other factors to be considered as well, *viz.*, that the transfused blood should be free from any disease (syphilis, malaria, etc.) and clot or air must not enter the vein. A thorough examination of the prospective donor together with his history regarding allergic diseases, malaria and other communicable diseases, and if time permits, Wassermann Reaction or Kahn test should invariably be done before selecting the donor. In hospitals where transfusion is required frequently a list of donors previously tested and classified is kept, who may be obtained on short notice. In every case, however, a direct matching should be done before transfusion to determine compatibility.

Blood testing—The method of testing blood is simple. Of course, such fallacies as auto-agglutination and pseudo-agglutination or rouleaux formation should be guarded against. Auto-agglutination does not occur at blood temperature, and rouleaux formation can be prevented by previously diluting the serum with once or twice its own volume of saline and a properly prepared 5 per cent suspension of the corpuscles. Rouleaux is never followed by hæmolysis, and can be broken up by smartly tapping the slide.

The routine method is to secure known high titre serum of Group A (II) and B (III) obtained with aseptic precaution and preserved by adding 1 per cent chloroform in small drop bottles or in sealed capillary tubes without any antiseptic, and kept in a refrigerator until required. Their potency should be tested from time to time. A drop of each is placed separately on a clean slide and to each a small drop of blood to be tested is added, having previously been diluted to 1:20 with saline, and thoroughly mixed. If agglutination occurs it will be seen in a few minutes by a hand lens or the low power of a microscope. Transfusion should never be done without directly testing the patient's serum and the blood of the prospective donor. To do this 4 or 5 c.c. of blood are drawn from the patient's vein and the serum is allowed to separate; to expedite, the blood can be centrifuged. A trace of blood obtained by a needle-prick from a finger of the donor is mixed with the serum and the effect noted. Similarly a drop of the patient's blood can be mixed with a drop of the donor's serum to ascertain whether the corpuscles of the patient are agglutinated by the serum of the donor (Kirschner, 1937). Another method is by mixing six drops of blood from the finger with one drop of a 5 per cent sodium citrate solution in a small tube, contrifuging, removing the supernatant plasma with a pipette and mixing a drop of packed cells with 2 or 3 c.c. of saline to form a cell suspension. The test is made on a glass slide as previously described. The whole test does not take more than twenty minutes. (David Harley, 1938).

Dosage—According to Marriot and Kerwick (*loc. cit.*) the volume of blood required depends on the patient's weight and the level of hæmoglobin desired. It may be calculated thus: (per cent rise in hæmoglobin divided by 100) multiplied by patient's normal blood volume in c.c. which is 40 c.c. per pound of body weight. In practice one pint of blood raises the hæmoglobin level by 10 per cent. In different conditions different rise of hæmoglobin is required, it may be 45 per cent or it may be anything up 100 per cent. If a rise of 33 per cent above the existing quantity is required two transfusions should be given with two days' interval between them. Harrison and Picken (1941) give the maximum as serum 3·4, citrated plasma 5·1 citrated whole blood 8 and defibrinated whole blood 6·6 bottles. Napier and Das Gupta (*loc. cit.*) write that in acute hæmorrhage the amount will depend on the quantity lost, but nothing less than 500 c.c. is likely to be effective. In anæmia repeated small transfusions of 300 to 400 c.c. are better than a single large one.

Materials

During this war, it has been found out that it is not necessary that whole blood should be administered every time; plasma and serum—either in a liquid form or preserved in dried form, have been extensively used.

Defibrinated blood has also been recommended for transfusion. The collecting jar, in which a glass rod is fitted, is constantly shaken to remove the whole of the fibrin from the blood. It obviates the after-effects but the results are clinically not so satisfactory as the citrated method.

Preserved Blood—Blood is collected and is stored at 4°C. with a preservative solution I.H.T. This stored blood can be successfully used several weeks after collection in cases of hæmorrhage. Hayes and his collaborators (1941) give this period as 30 days, while Editor, *Indian Medical Gazette* (*loc. cit*) only 10 days. "Bacterial activity of such blood for organisms such as staphylococcus aureas, streptococcus hæmolyticus and B. coli decreases after 7 to 21 days. The phagocytic activity of the neutrophiles is reduced after 72 hours and is almost absent by the seventh day. Platelets are scarce after 48 hours." (Kolmer, 1939). For this reason preserved blood may be useful in the treatment of hæmorrhage and shock but not in anæmias, the blood dyscrasias or infections. Potassium content of stored blood is increased with time and injection of large quantities at a time may produce toxic symptoms (Duliere, 1931; Scudder and others, 1939). Agitation of the preserved blood hastens potassium loss and the shape of the container also influences this. Tubular container is preferable to wide bottom flasks. It has been suggested that other elements such as magnesium, ammonium and phosphorus content of blood may also be affected in the stored blood. Further investigation is necessary on this matter.

Transfusion of plasma or serum is as effective as whole blood in acute hæmorrhage to combat loss of blood and shock

(Levinson, 1940). It has been found that only slight reaction if any, occurs after administration of serum. Both plasma and serum have this advantage that no test for matching is necessary. Pooled serum made up of 30 to 50 different specimens of blood never show rich agglutinin content (Datta and Agarwal, 1941). 500 c.c. can be given without blood grouping (Hayes *et al loc. cit.*) A pint of blood yields 250-300 c.c. plasma. In Russia *ascitic fluid* has been used successfully for transfusion.

Drying of serum and plasma has considerably simplified the question of storage and transportation. They have been found to keep well for 12 months at room temperature in the west. There are different methods of drying; one by Flosdrop and Mudd of freezing the plasma in carbon dioxide and evaporating it under high vacuum; another by Edward, Kayes and Davies (1940) of drying in a "continuous feed plasma drier", the plasma being sucked over in a thin stream into a special container and dried under low vacuum at 37°C. It is then removed under strict asepsis and sealed in ampoules. Hayes, Ray and Chopra (*loc. cit.*) of Lahore, have devised an apparatus, a modification of Edward, Kayes and Davies, for drying the plasma in tropics. Serum is concentrated by allowing its watery portion to evaporate in special cellophane bags. 20 gms. of solid plasma, which is equivalent to plasma-proteins of one pint of blood, should be dissolved in 250 c.c. of distilled water or 5 per cent glucose. Plasma-proteins are not materially altered by drying. Serum may be syphoned off the stored blood without disturbing the corpuscles after it has been allowed to stand for 5 days (Hayes and others, 1942).

Kolmer (1940) recommends transfusion of *resuspended corpuscles* remaining at the bottom after separation of plasma in suitable cases of anæmia. These red cells can be used, he says, with full oxygen carrying capacity up to 8 days. They are to be diluted with glucose saline. MacQuaide and Mollison (1940) say that reaction can be reduced by removing the white layer on the top consisting of leucocytes and platelets and filtering the mixture before use.

Placental blood and cadaver's blood—Goodall (1939) and his co-workers in Montreal advocate the use of placental blood. 50 to 125 c.c. may be obtained from each maternity case. Such blood can easily be tested and preserved for future use. Contamination can be avoided with a little care. Shamov (1937) and Yudin (1937) performed transfusion with cadaver's blood in Moscow. It has been ascertained that blood retains its vitality several hours (in Russia ten hours) after death in persons dying of accidents and may be collected within that period.

Blood Bank

Of late, Blood Banks have been established in many centres in differest countries. It has the advantage of obviating the necessity of hunting after a donor. Blood for Bank is collected ann stored at 4°C with a preservative solution known as I.H.T. (from Institute of Hæmatology and Transfusion of Moscow), consisting of sodium chloride 7 gm, sodium citrate 5 gm, potassium chloride 0·2 gm, magnesium sulphate 0·04 gm, distilled water to 1000 c.c. It is mixed, volume for volume, with the blood, which may be drawn from the donor either by a Potain's aspirator as advised by Napier and Das Gupta (1941) or in a Horlicks bottle fitted with a Higginson's syringe as recommended by Hayes and others (1942). Flow of blood is helped by creating negative pressure in the bottle by means of the pump.

Technique

There are *two methods* of transfusion: (*a*) direct and (*b*) indirect and a third, which should properly be placed under (*b*), the drip method. Direct transfusion must necessarily be with unaltered blood, while the others may be with (1) citrated blood, (2) defibrinated blood, (3) heparinized blood, (4) preserved blood, (5) serum or plasma, and (6) diluted red corpuscles.

In *direct transfusion* a large syringe with a two or three way stop-cock is used. The donor and the recipient are placed side by side on two tables in such a way that the left or the right arm of one when fully abducted lies alongside the left or the right arm respectively of the other similarly abducted. Two needles fitted with the two ends of the stop-cock are each introduced into the cephalic veins of the donor and the recipient. By proper manipulation blood can be drawn from the donor and pushed into the vein of the recipient. The syringe should previously be rinsed with a sodium citrate solution. By this means the quantity of blood can be measured and the flow regulated. In acute hæmorrhage 15 to 20 minutes should be taken for the transfusion (Munro Kerr and others, 1937; Napier and Das Gupta, 1941). Hayes and others (1941) say that the first 500 c.c. should be given in half to one hour, then the rate should be slowed down to 40 drops per minute. Anything up to 1000 c.c. may be injected by this method. A donor may lose 500 to 1000 c.c. without disturbance, although he may feel a little weak which may be overcome by a substantial meal and a little brandy. The physiological reserves of the body are quite capable of compensating this loss immediately without in any way affecting the body functions, and the stimulation to the healthy hæmopoietic system caused by this blood loss, is certainly inocuous and quite possibly beneficial and the loss will be made good within a week. (Ed. *Indian M. Gaz.*, December 1941) Asthenic people show the greatest power of regeneration (Seltsovsky, 1940).

Indirect transfusion may be done by the gravity method as employed in saline injection. Blood used is either fresh or stored. Fresh blood may be either citrated or heparinized. The citrated blood is collected in a graduated cyclinder in which a 2·5 per cent sodium citrate solution is added. Greval, Chandra and Chatterjee (1941) use a 3 per cent solution and Napier and Das Gupta (1941) use 3·8 per cent solution in proportion of one part to ten parts of blood. This mixture can be kept for several hours on ice before injection. Triple freshly distilled water, absolutely pure sodium citrate and clean sterile instruments ensure against any untoward complication.

Per Hedenius (1937) of Stockholm with experience of more than 150 transfusions, tells us that if a sterile 5 per cent heparin (a powerful anticoagulant) solution containing a 0·25 per cent tricresol is injected into the donor in a dose of 1 mg. per kilo of body weight, within half an hour of the proposed transfusion, coagulation of the proposed blood does not take place. On the other hand, it does not at all affect the clotting time of the recipient's blood, and it is harmless to the donor and the recipient. Scruch (1938) and Clemens

(1938) from Germany and Knoll (1938) from Switzerland point out that this method simplifies transfusion, making it possible to carry it out without special operative procedures, apparatus or trained staff. The actual transfusion can be carried out by allowing the blood to run into a sterilised vessel and then injecting with an ordinary 50 c.c. syringe.

Drip transfusion—This is done by means of a specially prepared apparatus (Marriot and Kerwick, 1935). Oxygen is constantly bubbled through the citrated blood to prevent sedimentation of the corpuscles. A glass cannula is introduced into the saphenous vein, a hand's breadth below the knee or a vein in the middle of the forearm and kept fixed with the limb; in case of lower limb the leg is immobilised by means of a suitable splint. The rate of flow should be equivalent to the pulse rate or a drop per second (Wakely and Hunter, 1937) or one c.c. per hour per pound of body weight, and in cases of severe anæmia and cachexia half this rate (Marriot and Kernick, 1940). Drip transfusion "is of great value in a large number of serious conditions, such as, septicæmia, uræmia, hyperemesis gravidarum, serious anæmia due either to deficient hæmopoiesis in the bone-marrow or to excessive loss or destruction of red corpuscles following upon hæmorrhage etc., to allay thirst in late cases of intestinal obstruction, in 'bad surgical risks' and in immuno-transfusion, that is, the use of blood from cases which have recently recovered from some particular infective condition or have been inoculated with corresponding vaccine" (Wakely and Hunter, 1937). Marriot and Kerwick (*loc. cit.*), enumerate the following indications for drip transfusion:—(1) when the anæmia reached a dangerously low level, (2) when anæmia is complicated by the need of surgical treatment, (3) when the patient's recovery should be expedited for special reasons, (4) when anæmia is aplastic in type, and (5) when it is the result of septic and infective conditions. Bagdasarov (1937) of Russia successfully treated 300 cases of peptic ulcers with repeated small intravenous injections (3 to 4 c.c.) of goat's blood. Heterogenous transfusions have also been advised for trophic ulcers of the skin and inflammatory joint lesions. It will be interesting in this connection to recall the external use of heterogenous blood for skin diseases in India.

Transfusion in Infancy

Garcia Perez (1939) and Castellanos and Rene Monters (1939) from Havana report beneficial effect of blood transfusion in children in toxæmia and convulsions. There are no untoward results. Fever, dyspnœa and general symptoms were abated in most cases. 150 to 200 c.c. usually obtained from a parent were injected either to the internal saphenous, the external jugular or the anticubital veins. It is, however, not stated whether blood was given without consideration to grouping.

Dangers and Precautions

In all cases of transfusion the recipient is watched closely *for a few minutes*. If any symptoms such as pallor, dyspnœa, cramps, excitation, collapse, etc., occurs, transfusion is stopped immediately. If they are mild and disappear rapidly the operation may be continued cautiously. Cases of death following transfusion have been observed by a number of observers. Plumers (1936) has seen it to occur from heart failure in 7 cases. All ordinary precautions were taken. In only one no retesting of the same donor was done before the transfusion was repeated after 14 days' interval; here anaphylactic shock developed. Baker (1937) has seen it following overheating of the blood. The patient became more and more unconscious with occasional attacks of vomiting and died of urinary suppression on the 14th day. Urea concentration of blood steadily rose to 540 mg. per 100 c.c. Daniel and others (1941) have seen it to occur with renal insufficiency in 7 cases. Nausea, vomiting hæmoglobinuria, jaundice, oliguria, stupor and uræmia have been noticed in these cases. The following pathological changes have been found: interstitial œdema, leucocytic infiltration, degeneration and necrosis of tubular epithelium and the deposition in the renal tubules of granular pigments derived from hæmoglobin and focal necrosis of the liver cells. They have advised more careful matching by use of tube preparations incubated at 35°·5C. for one hour and administration of alkalies to patients before transfusion.

Acknowledgment

I am indebted to Vishagacharya Pandit Jyotish Chandra Saraswati of Calcutta for the history of Indian transfusion and to Dr. P. K. Banerjee, M.B., D.P.H., Khulna, for helping me in collecting materials for this purpose.

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CASE NOTE

CAPILLARY NAEVUS

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The various types of new growths of the skin are of great importance to the dermatologists. Angiomas constitute a negligible percentage of cases attending a hospital out-door.

Hæmangiomata may be classified as follows:—

(1) Definitely malignant metastasizing hemangiomata (hæmangioendotheliomata, angiosarcomata, etc.,) in which the secondary growths are also histologically malignant.

(2) Metastasizing hæmangiomata in which the primary and secondary tumours are seemingly, histologically benign, the malignancy being recognised clinically, chiefly by the metastatic features; originally a very rare practically unknown group but now forming a growing list.

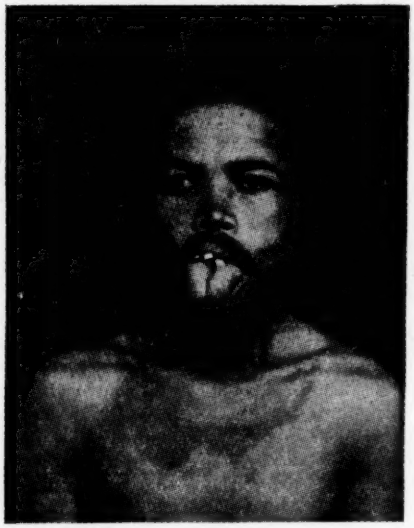
(3) Multiple (non-metastatic) benign hemangiomata appearing contemporaneously over the body but particularly in the abdominal visceral organs (liver, spleen, etc.)

Weber (1927) reported a case of early angioma seriginosum of the shoulder. Matas (1940) reported a case of congenital arteriovenous angioma of the arm which was found to be histologically a benign hæmangioma which continued to grow from birth, as the arteriovenous cavernoma from the hand to the axilla, for 21 years without any apparent metastasis during that period. At the age of 21, the arm was amputated at the shoulder, the patient recovering and remaining entirely well for 11 years. Then two secondary angiomata of the same histologic type, made their appearance, one in the right axilla and in the scar left by the disarticulation and the other at a distance on the chest wall in the right submammary region. Clinically and histologically, the two secondary growths were identical with the primary growth as pulsating arteriovenous erectile cavernomata. Jaffe (1920) reported multiple hæmangioma of the skin and internal organs. Thomson (1939) observes that it must be realized that such irregularities do not mean that malignancy has intervened and actually malignant hæmangiomas are among the rarest of all diseases and when they do occur they practically always arise from and affect internal organs.

I have observed only three cases of capillary nævus in the out-door in about five years' time. The first case was a healthy young man of 38 who had a patch since his birth on the right frontal region about 2"×1" and has hardly increased or decreased in size and has given him no trouble.

The second case was that of a boy of 12 years age showing a nævus in the left axilla extending upto the left infrascapular region. It is there since his birth, neither increasing nor decreasing in size and he has no trouble.

The third case, R. R., Hindu male, 26 years old, married and inhabitant of Nepal. Family history, nothing particular; personal history, from his birth he had purple coloration of the cheeks and chin which has been spreading gradually and has now reached upto the parietal regions on either side covering half of the eye-lids, both upper and lower lids on the right and reaching upto the corner of the left eye covering both ears and the lower lip. Spreading downwards along the front of the neck it covers medial halves of both the clavicles and spreading like the Japanese fan on the front of the chest up to the level of the third intercostal space and sweeping over the back of the neck from either side and leaving a clean space of about one inch and a half from the 7th cervical vertebral process.



The upper jaw and the mandible both look enlarged in size. Macroglossia and macrochelia are present; there are cracks present on the tongue. Hypertrophy of the upper and lower gums can be seen. Teeth are separated and asymmetrically arranged. Occasionally there is bleeding from the gums. He has fairly good growth of moustache but there was no beard excepting a few thin hairs on either cheek. He has developed a leucoma on the right cornea after an attack of small-pox at the age of 10 years. The boy had three applications of radium but went away without further treatment though the result was very encouraging.

Treament—Thompson (1939) advocates the use of carbon dioxide snow, injection of sodium morruhate, or 0·2 c.c. diluted acid hydrochlor. and treatment by radiotherapy. Molesworth (1933) advocates the treatment of hæmangiomata within the first six months of life and preferably during the first month of life when it can be suppressed by a single normal tolerated dose of radiation, while between six months and a year the treatment has generally to be repeated. The methods of choice being radium or x-rays rather than diathermy or carbon dioxide.

Acknowledgment—I am thankful to Rai Bahadur, Captain N. Pal, K.I.H., B.A., M.B., F.R.C.S. (Edin.), Professor of Surgery and to Dr. H. P. Lal, M.B., L.R.C.S. (Edin.), Surgical Registrar, for discussion and permission to publish the case report. I am also thankful to my House Surgeon and Dr. Mehrotra for help.

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JOURNAL OF THE
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RUPTURE OF THE UTERUS

Though rupture of the uterus remains one of the most serious complications of pregnancy and labour, very little work has been done in India on the subject. With the present state of maternal care and antenatal service in the country, it is strange that serious attention of the gynæcologists and obstetricians have not been drawn to this problem with the idea of preventing the condition as much as possible. Chakraverti[1], writing in 1941, has remarked, "fortunately it is a very rare accident and mostly met with in neglected cases of prolonged and obstructed labour." But he gives "incidence being 1 in 1250" in his own hospital and he admitted "that a certain number of cases of rupture of the uterus are not recognised. Of the deaths attributed to shock, hæmorrhages or some other undetermined conditions, if properly investigated by post-mortem, a good many rupture of the uterus might be discovered as the real underlying cause." So his subsequent remarks do not support his generalisation regarding incidence. As it is, his figure is high enough to label the condition as "rare." If this be the incidence in one of the leading city hospitals, it can be easily understood that it will be very high in moffusil towns and outlying villages. Beck's[2] estimate of "1 in 500" in countries with backward maternity service might be a true picture here. Sinha[3] has seen quite a number of cases (three or four) within last two or three years in another city hospital. Davis has shown that the incidence at the New York Lying-in Hospital was 1 in 1759. Eden and Holland reported its incidence as 1 in 3000. In Rotunda Hospital of Dublin, the rupture occurred in 1 in 1689.* Mahfouz Bey[4] reported that ruptured uterus accounted for about 1·33 per cent of all cases of difficult labour admitted to Kasr El-Ainy Hospital. Our figures and experiences of the obstetricians of India do not favour well with these figures. But we must admit that available statistics in India is too meagre to pass any opinion. Patil[5] has contributed an interesting and illuminating article on the subject, which is printed elsewhere in this issue. Unfortunately, she does not give us any statistical figure. So we are in the dark what is the incidence in her part of the country. From the descriptions of the cases, it can be easily understood that incidence must be very high. We hope that Patil and other obstetricians of our country will study the subject with more thoroughness and enlighten us with their experiences.

Many causes have been ascribed which predispose the uterus to rupture during labour. Natural weakness of the uterine wall; scars in the wall of the uterus due to previous cæsarean section; fatty, hyaline, granular and fibrous degenerations, maldevelopment and malposition of the uterus; unskilful operative measures to deliver the fœtus in cases of contracted pelvis, transverse presentations and hydrocephalus. and, administration of oxytocics. The main reason seems to be unskilful attempts at delivery and failure to recognise the abonormality in pregnancy. The cases reported by Patil were all due to mishandling by the *dais*. We would also draw the attention of the practitioner to the strange revelation by Patil; we mean, the practice of *kallo*. This should make our Public Health Department alive to the dangers of leaving our maternity cases in the hands of the untrained *dais*. It must be mentioned here that spontaneous rupture of the uterus is also possible. Injudicious administration of oxytocics also form quite a formidable number. Mahfouz Bey has given a detailed study of rupture of uterus due to injudicious administration of pituitrin. He collected as many as 24 cases from the literature. The first case of Patil is probably also due to the untimely administration of pituitary extract. Many more cases must have happened due to this cause.

Prognosis in such a severe injury like rupture of the uterus is grave. Bey gives his figures as 62·9 per cent and 55 per cent by conservative treatment and laparotomy respectively. Out of 9 cases, three cases died in Patil's series, but if a bigger series had been discussed then the mortality would have been much more. Prognosis also depends much on the amount of hæmorrhage, sepsis, shock and malhandling.

Treatment of the condition is both expectant and operative. Most modern writers condemn expectant treatment and advise laparotomy in every case (Bey). This has, however, its limitations, as will be borne out by the experiences of Patil, who got very good results with conservative treatment. One thing is certain. "In the presence of severe shock and marked sepsis", said Bey, "which are the rule in most cases of rupture of the uterus, laparotomy is attended with grave results." Supportive treatments play a considerable part in the ultimate prognosis of the case, whatever method is attempted. Chakraverti, however, opines that "the conservative operation of closing the rent and leaving the uterus behind, does not as a rule yield better results", but does not give any supporting figures.

Munro Kerr[6] is also of opinion that "undoubtedly the best treatment, *when it is at all possible*, is abdominal section. ....The ideal procedure is complete hysterectomy." Unfortunately, no comparative statistics of treatment has been published in our country.

[1] CHAKRAVERTI, J. (1941)—*The Carmichael Medical College Magazine*, Calcutta. 10, 87.

[2] BECK, A. C. (1935)—Obstetrical Practice. Balliere, Tindall and Cox.

[3] SINHA, R.—Personal communications.

* All these figures are given by Chakraverti; but he does not mention the source.

[4] BEY, MAHFOUZ (1932)—*Jour. Obs. Gyn. Brit. Emp.*, 39, 743.

[5] PATIL, K. (1943)—*J. Indian M. A.*, 12, 291.

[6] MUNRO KERR (1939)—Combined Text Book of Obstetrics and Gynæcology. Third Edn. E. and S. Livingstone, Edinburgh.

MINERAL WATERS OF INDIA

The medical profession in this country is not perhaps aware of the presence of rich and a variety of mineral springs in India. It is sad but true that they are more familiar with the bottled waters of Apenta, Vichy, Karlsbad, Marienbad and Plombieres. India has got more than one hundred known springs. There are 2 springs in Assam, 5 in Beluchistan, 12 in Bengal, 31 in Bihar and Orissa, 24 in Bombay, 4 in Central Provinces, 2 in Hyderabad, 12 in Kashmir, 5 in Madras, 1 in Mysore, 14 in the Punjab, 1 in Rajputana, 4 in Sikkim and 8 in United Provinces.[1] Hot springs often sulphurous are common in Sind and Beluchistan on one side and Assam and Burma on the other side. It is peculiar that their distribution is similar to the presence of petroleum. Other springs are found along the foot hills of the Himalayas sufficiently well distributed to permit easy transport. Springs at Jalamukhi in the Kangra district contain bromide and iodide of sodium and potassium.

The realisation of the efficacy of mineral waters has been recognised by lay public in this country for a long time. The efficacy was supposed to be due to some supernatural power and consequently religious centres had cropped up, around these springs *e.g.*, the hot springs of Mani Karu in Kulu, Lasundra in the Kaira district and Vajrabi in the Thana district of the Bombay Presidency. It is not an uncommon sight to see people with their sick and crippled making an yearly pilgrimage to these places.

It is not exactly known how the mineral waters produce beneficial effect. An artificial solution of the salts in proportion as found in analysis would not produce the same effect, so the explanation must lie somewhere else. Analysis of water throws little light on the therapeutic action. The activity may be due to the presence of the salts in the nascent form and the effect depending upon the combination of salts, one acting as adjuvant to another. Some salts are present in the form of free ions as in waters of low mineralisation which are radioactive. It is claimed that these radioactive waters, when taken fresh, increases the excretion of total nitrogen, urea, uric acid and sodium chloride.[2] Steichen and Sierp[3], Nag[4] had investigated the radioactivity of some thermal springs in Bombay, Madras, and Rajgirih. More work has yet to be done in this direction to evaluate the efficacy of the water. High radioactive properties have been detected in springs at Tuwa, Vajrabi and Unci. By mouth it acts as diuretic and mildly laxative. The spa treatment regulates the disordered metabolism by hydropathic applications. As a rule radioactive thermal spas are used exclusively for immersion baths, douche, massage and Plombieres treatments, strong salt waters for plunge and immersion baths and sulphur water for immersion baths, peat treatment and Plombieres douches.

The number of diseases claimed to be relieved or cured by mineral water is almost prodigious. The list mainly includes vague and chronic diseases of gastrointestinal tract, metabolic disorders such as gout, rheumatism and obesity. How far the mineral water or/and the mode of life in leisure away from domestic worries with diversions in the music, swimming and routine exercise are responsible, is difficult to assess. But some patients do derive benefit from a visit to the spas.

The question of developing the spas was raised in the All-India Medical Conference held at Poona in April 1931. In a resolution, the Conference recommended that "This Conference is of opinion that as many mineral and thermal springs exist in various parts of India, the Government of India should appoint a Committee to investigate and suggest how they can be utilised and developed to greater advantage." Ray[5] suggested the formation of a Committee like the Committee for the study of hydrology in Great Britain, to go into the subject scientifically and students and medical practitioners should be allowed opportunities to see the usefulness of hydrology as a method of treatment.

Very little progress has been made in the development of spas in our country. A small institution was started in the Bombay Presidency in 1938. An attempt was made to start a Mineral Water Institute in Sind. Bose[6] investigated the possibilities of mineral springs at (1) Sitakund near Monghyr, (2) Rajgirih near Patna, (3) Suraj Kund near Hazaribagh, (4) Bakreswar near Suri in Birbhum. To be financially lucrative, a natural spring must be situated in a bracing climate and should be easily approachable. Promenade, provisions for diversions *e.g.*, games, music and other entertainments are additional attractions. Arrangement should also be made for people who like quiet and peaceful recreation. A properly equipped nursing home in the area can take charge of the patients who require special treatment.

This war has almost stopped the import of mineral waters. Now is the time to develop the spas on modern lines so that they may be useful to the sufferers. The waters should also be commercially exploited. We think it will find a good market immediately and much national wealth will be saved. With proper propaganda to make the spas popular, the commercial development of Indian mineral and thermal waters would be attended with great success.

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[1] Ray, K. S. (1932)—Mineral Waters of India—*J. Indian M. A.*, 1, 223.

[2] Buckley, Charles W. (1931)—British Spas: Their Waters and Method of Treatment, *Indian M. Gaz.* 66, 150.

[3] Steichen, A. and Sierp, H. (1911)—*Indian M. Gaz.* 46, 457. Steichen, A. (1912)—*Ibid* 47, 469.

[4] Nag (1931)—Transactions of the Bose Research Institute.

[5] Ray, K. S. (1932)—*J. Indian M. A.*, 1, 221.

[6] Bose, Ajit M. (1939)—Hydrotherapy and the Possibility of Spa System in India, *Calcutta Med. J.*, 35, 345.

CURRENT MEDICAL LITERATURE

MEDICINE

An Investigation into the Effect of Intravenous Injections of Sucrose on the Cerebrospinal Fluid Pressure as Measured by Puncture †

Paterson (*Proc. Roy. Soc. Med.*, 1942:35:530) writes that intravenous injection of concentrated sucrose solutions has been used in many neurosurgical units during recent years as a means of reducing a raised intracranial pressure and has felt it desirable to investigate to what extent this treatment was capable of producing the designed effect.

In his investigation the simpler method of performing lumbar punctures before and after injecton of sucrose was thought too unreliable, as cerebrospinal fluid may leak from the initial puncture hole in the theca. The lumbar puncture needle was accordingly inserted with the subject in the lateral position, and was connected by rubber tubing filled with saline to a graduated vertical glass tube, the upper end of which was filled with air and in communication with a tambour actuating an ink-writing pen on a moving drum. Considerable changes in pressure could thus be graphically recorded without displacement of more than one to two cubic centimetres of cerebrospinal fluid. Preliminary tests of the apparatus on 10 subjects with a normal and 9 with a raised cerebrospinal fluid pressure gave steady records for periods of upto six hours, and demonstrated the sensitivity of the apparatus to transient changes in pressure.

In eight subjects with normal cerebrospinal fluid pressure, the intravenous injection of 100 c.c. of 50% sucrose solution (in 7 subjects) and 50 c.c. (in 1 subject) produced a definite reduction in pressure in only four cases, the maximum effect being a fall of 30 mm. maximal in 15 minutes, and of a total duration of 60 minutes.

Eight subjects with raised pressures received a similar injection of sucrose, seven being given 100 c.c. and one 50 c.c. In five cases a definite reduction in pressure resulted, but in three cases with pressures of from 200-300 mm. no effect was obtained. The maximum reduction was one of 50 mm. in a subject with an initial pressure of 430 mm. This occurred in 15 minutes. Fifty minutes later the pressure had risen to 480 mm. In none of the subjects was a significant alteration in blood pressure, pulse rate, or clinical condition observed to follow the injection. Most of the subjects had cerebral tumours.

The author concludes that in the doses used, 50% sucrose solution produced only small and transient reductions in the cerebrospinal fluid pressure which were of little therapeutic value.

Bronchiectasis without Disability †

Martin and Berridge (*Lancet*, 1942:2:327) write that until recently the term bronchiectasis usually denoted an ill patient with clubbed fingers, persistent cough and copious foul sputum, with ultimate death from toxaemia or cerebral abscess.

The authors have investigated 25 cases of bronchiectasis in soldiers of healthy appearance and little incapacity. All cases were confirmed by bronchography (the technique is described in detail in the original paper). The ages of the patients varied from 19 to 52 years and twenty-one of them were between the ages of 19 and 29 years. *Intermittent cough with sputum* was the presenting symptom in 24 cases. The duration of the cough varied from a few weeks to many years. Sputum was generally purulent but never copious or offensive. Slight hæmoptyses had occurred in 7 cases. Only 4 cases lost weight and none had severe night sweats. In 13 cases there was a history of previous pneumonia, mainly in childhood; 8 cases gave a history of pleurisy, and 17 had had isolated or repeated attacks of bronchitis, especially in the winter. The authors regard the earlier attacks of pneumonia as probable initiating factors in the production of bronchiectasis, owing to incomplete re-expansion of the affected lung or lobe leading to bronchial dilatation. None of the cases was toxæmic or ill-nourished. Only one had gross clubbing and five had slight clubbing of the fingers. Impaired percussion note, poor air entry and persistent râles were the commonest physical signs in the affected lungs. Bronchiectasis was diagnosed from the plain x-ray film in 20 of the 25 cases, but in all cases it was confirmed by bronchography using Neohydriol (May and Baker, Ltd.), an iodised oil containing 40% of iodine. Although bronchiectasis may frequently be diagnosed from the plain x-ray film, the authors regard bronchography as essential for demonstrating the extent of the disease and proving the presence or absence of bronchiectasis in doubtful cases. On the plain x-ray film saccular bronchiectasis is almost invariably evident. In the cylindrical type of bronchiectasis suggestive appearances are partial or total collapse of a lobe, peripheral basal emphysema and exaggeration or crowding together of bronchial markings. These latter changes are, however, of a secondary nature, and are not therefore pathognomonic of bronchiectasis.

The authors emphasize that close co-operation between physician and radiologist is essential in the election of cases for bronchography. Evidence of nasal sinus infection was noted in 7 out of 17 cases of bronchiectasis submitted to radiological investigation of the sinuses, and this associaton has been commonly mentioned by other authors. In the present series of 5 cases the bronchiectasis was bilateral in many and saccular in 9, yet the patients had suffered little disability in civilian life and probably would never have been admitted to hospital in peace time. The more exacting conditions of army life may have brought out the symptoms. The authors consider that the bronchiectasis in most of the cases dated from chest diseases in childhood, yet the men were well enough twenty years later to be accepted for military service. This does not accord with the orthodox gloomy prognosis for patients with bronchiectasis, which has been based on the outlook of advanced cases usually found in hospitals. Time alone will show whether these cases now without disability will progress to the advanced foetid stage, but the authors believe that earlier diagnosis will show that the expectation of life for patients with bronchiectasis is not so short as has been supposed in the past.

Pneumothorax Treatment*

Moriss (*Am. Rev. Tuberc.*, 1942:46:628) reviews the ultimate results in 770 patients selected for pneumothorax

treatment between 1921-1939 at the Gaylord Farm Sanatorium in Wallingford, Connecticut. Of these 770 cases selected for pneumothorax, technical failure of collapse, as evidenced by inability to produce any collapse or a collapse so ineffective that it was abandoned in less than three months, occurred in 157 cases, or in 20·3 per cent. Of these, 60 patients died, a mortality of 38·2 per cent for the category. Of the 770 total cases, 613, or 79·3 per cent, received a technically successful pneumothorax. Of this group, 370 are fully traced throughout the course of their pneumothorax and for an average of five and a half years after pneumothorax was discontinued. Of these, 245, or 66·2 per cent, are able to work full-time, an additional 23, or 6·2 per cent part-time. Twenty-seven patients are still curing and 75, or 20·3 per cent, have died since the institution of collapse. The most important factors unfavourably influencing end-results are: ineffectiveness of collapse, moderate contralateral lesion at onset, massive effusion of empyema, severe contralateral spread of lesion during collapse, duration of collapse under two years. At time of re-expansion, cavity was closed in 96·3 per cent, sputum was negative in 89·6 per cent. Anatomical end-results in re-expanded lung were: excellent in 23·5 per cent, very good in 16·2 per cent, fair in 32·0 per cent, poor in 25·3 per cent and non-expandable in 2·9 per cent. Relapse in either the pneumothorax or contralateral lung occurred in 35 cases, or in 9·4 per cent of the series. Of these less than one-third died. The most important unfavourable complication of pneumothorax is the development of a large effusion which occurred in this series in 29 per cent of the cases and in itself appreciably increased the chances of an unfavourable outcome. In this group of large effusions one in four developed an empyema and of those almost one-half died. The total mortality from empyema in the series, however, was 3·5 per cent and the incidence in the series 7·1 per cent. Pneumothorax, in spite of its hazards, the author concludes, is still a valuable method of treatment for properly selected cases of tuberculosis.

The Sodium Salts of Sulfonamides and Hypodermoclysis*

Taplin and others (*J.A.M.A.*, 1943:120) write that the purpose of this paper is to describe an experience with the subcutaneous use of sodium salts of sulfathiazole and sulfadiazine in addition to that of sulfapyridine, and to emphasize that these drugs may be administered safely and conveniently by hypodermoclysis. During the past three years these sulfonamide compounds were administered by this route to 160 cases of pneumonia and other diseases for which this group of drugs was indicated but in which oral administration was difficult or impossible. The majority of the patients were treated with 0·5 per cent sodium sulfonamide solutions made by dissolving 5 grams of sodium sulfonamide in one liter of isotonic solution of three chlorides, isotonic solution of sodium chloride or one-sixth molar sodium lactate solution. Concentrations of sulfonamide compounds as high as 0·8 per cent were used. Isotonic solution of sodium chloride was the vehicle most commonly employed. Decided variations in the blood concentrations of sodium sulfonamides were encountered when given by hypodermoclysis. The values were not predictable. Treatment must therefore be based on the blood concentrations encountered for each individual patient. Sodium sulfadiazine was considered the most convenient drug to use hypodermically. A 1000 c.c. hypodermoclysis containing 5 grams of this drug usually gave satisfactory blood concentrations for about twenty hours.

Use of Adrenal Extract in Fever Therapy*

Edelmann and others (*J. Clin. Endocrinol.*, 1943, Jan.) write that it has been previously observed that adrenal extract alleviated many of the ill effects of fever therapy. Weakness, nausea and vomiting were reduced. Herpes was absent or less severe. Recovery was more rapid and subsequent treatments were better tolerated. This study is an attempt to discover the underlying factors involved in this effect. Twelve patients who were treated by fever therapy weekly for ten weeks were studied to observe the effect of adrenal extract administration. This extract decidedly reduced the degree of fatigue and accelerated the rate of recovery after one or two treatments. The frequency and intensity of the other symptoms were also favourably affected. Desoxycorticosterone acetate produced no beneficial effect. Extract prevented or reduced the fall in plasma sodium in many instances but had little effect on the potassium, chloride and proteins. This was explained by the reduction in excretion of sodium in the perspiration. Potassium and chloride excretion in the perspiration was also reduced in some instances. The retention of sodium when adrenal extract was given was insufficient to account for the amelioration of the unfavourable clinical reactions to fever therapy. Blood sugar fell when extract was not given but rose when it was administered. The authors suggest that the extract may act on the central nervous system.

Sulfanilamide and the Prevention of Rheumatic Recurrences*

Kuttner and others (*J. Clin. Investigation*, 1943 Jan.) write that during two successive winters, 1940-1941 and 1941-42, the 108 rheumatic children at Irvington-on-the-Hudson, New York, were divided into two groups matched as closely as possible, one of which was given, from October 1940 to June 1941 small daily doses of sulfanilamide(54 children). During the second winter, 54 children were given sulfanilamide and 50 served as controls. Only children who showed neither clinical nor laboratory signs of rheumatic activity received this drug. The results of this study showed that streptococcal upper respiratory infections and rheumatic relapses in rheumatic children can be prevented by the prophylactic administration of sulfanilamide. Toxic manifestations of sufficient severity to necessitate the withdrawal of the drug occurred in 15 per cent of the patients. Children who did not develop toxic reactions tolerated the drug well. The effectiveness of sulfanilamide in preventing rheumatic recurrences indicates that infection with Group A hemolytic streptococci is an important factor in the etiology of rheumatic fever.

Toxicity and Efficacy of Penicillin*

Robinson (*J. Pharmacol. & Exper. Therap.*, 1943, Jan.) reports that a study was made of the toxicity and efficacy of penicillin in certain bacterial, virus, and protozoan infections. Penicillin was found to be a highly effective chemotherapeutic agent in infections caused by gram-positive bacteria in mice.

Crude penicillin is toxic for mice when given intravenously in single doses of 0·5, 1·0, 1·5 and 2·0 grams per kilogram of body weight. More highly purified preparations appeared to be less toxic than the crude preparation when compared on a weight basis. When given subcutaneously, penicillin is well tolerated by mice in daily doses of 1·6 grams per kilogram over a five-day period. Under the same conditions 3·2 grams per kilogram are lethal for some mice. The toxic dose of crude penicillin appears to be about 64 times the effective dose as determined by subcutaneous injection in mice. On the basis of weight, penicillin appears to be more effective than sulfanilamide and its derivatives in streptococcal, pneumococcal and staphylococcal infections in mice. Penicillin had no apparent effect in experimental infections caused by Mycobacterium tuberculosis, Trypanosoma equiperdum or the influenza virus P R 8.

SURGERY

Treatment of Shock by Direct Action on the Vegetative Nervous Centres

Stern (*Brit. M. J.*, 1942:2:538) gives in the following lines the summary of the observations on the treatment of shock by direct action on the vegetative nervous centres: (1) In the last phase of traumatic shock there is first of all a considerable fall in the tone of the sympathetic nervous system and a partial rise in the tone of parasympathetic nervous system. (2) The most effective way of combating traumatic shock in its later phase is to raise the tone of the sympathetic centres by direct action on the vegetative centres; potassium phosphate simultaneously raises the tone of the sympathetic centres and lowers the tone of the parasympathetic. (3) By direct action on the nervous centres the ionic potassium causes an excitability of the sympathetic nervous centres, whereas the ionic phosphates, by concentrating the ionized Ca, cause a diminution of the tone of the parasympathetic nervous centres. (4) A direct introduction of potassium phosphate into the cerebrospinal canal contributes to a quicker action of this substance on the nervous centres and at the same time obviates the possibility of its opposite effect on the peripheral part of the vegetative nervous system. (5) The use of potassium phosphate as an anti-shock remedy is indicated in all those cases in which there is a diminution of the tone of the sympathetic nervous centres, such as a fall of the blood pressure, a lowering of cardiac activity and respiration, diminution of excitability, reactivity, etc. (6) Potassium phosphate must never be used in cases in which there is increased excitability of the sympathetic nervous centres, such as sometimes occurs in the first stage of shock. (7) If hæmorrhage is present it must be arrested by all available means because the considerable rise of the blood pressure through the introduction of potassium phosphate will definitely increase hæmorrhage. (8) To avoid a repetition of shock it is necessary after the introduction of potassium phosphate to remove the actual cause of shock, in particular painful stimuli. (9) To ensure the direct action on the vegetative nervous centres, which are situated in the ventricles of the brain, potassium phosphate must be introduced directly into the ventricles. This is done by means of cisternal puncture. The fluid must be introduced with a definite pressure and the direction of the needle must be correct. The position of the patient must be horizontal, preferably on the left side, and the head must be lower than the body. (10) One must act quickly, without loss of time, so as to avoid a complete exhaustion of the vegetative centres. (11) The introduction of potassium phosphate does not exclude all the other measures against shock, especially blood or plasma transfusion. (12) Blood transfusion must be done in all cases where there is marked loss of blood. In other cases a blood transfusion is not absolutely necessary.

Chronic Head Cases†

Anderson (*Lancet*, 1942:2:1) describes a clinical investigation of a series of 150 consecutive military patients in whom past head injury was held responsible for symptoms. The average duration of symptoms before admission was 10 months, and the symptoms included headaches, giddiness, faints, irritability, mild depression, manic-depressive response, impaired memory and concentration, hysterical and epileptic fits, fugues, amnesias, pareses, sensory disturbances and impotence. With the exception of a small number of cases with neurological signs (7%), it was found that not one symptom or group of symptoms was pathognomonic of psychogenic or organic change. The duration of symptoms was no guide to their origin, and it was only by assessing the personality as a whole and its reactions to psychical or physical trauma, that a true picture of the reactions could be reached.

The author classifies the reactions seen in this series as follows:—I. *Neurotic (69 cases)*. In this group there were 62 hysterical cases. Most of these were formerly unstable personalities, but there was a fair number of previously well-integrated individuals in whom head injury acted as a precipitating factor in the production of a neurosis due largely to guilt over feelings of fear and hatred aroused by active warfare. Five of these cases were mentally defective and their responses to trauma arose from anxieties about inability to fit in with a skilled and mechanised army. Seven cases were classified as obsessional in type. Doubts, indecisions and preoccupations were focussed on the previously injured head and there was a strong denial of the emotional problems behind the attitude shown. II. *Organic Sequelæ*. Symptoms were judged to be of physical origin in 56 cases. 23 showed intellectual deterioration on mental testing and 4 showed character change. 12 were only temporarily dazed but yet showed organic residual symptoms. III. *Psychotic Reactions*. There were 14 cases in this group. They were manic-depressive or schizophrenic in character and 8 of them gave histories of previous psychotic disturbances in themselves or in their families. IV. *Mixed Conditions*. Ten cases were placed in this category. Their symptoms were both neurotic and organic. Neurotic symptoms arose from the attempt to deny a change in the personality arising from organic damage. There was only one *malingerer* in the series and his previous history showed him to be a psychopath.

Treatment included psycho-therapy, graduated physical exercises (including head exercises), narco-analysis, continuous narcosis and insulin sopor.

Of the whole series of 150, 64 returned to their units and 86 were recommended for discharge from the army. Responses to head injury (as to any other trauma or change) depends on the patient's habit or response to change, and on his emotional attitude to his fears of alteration of personality, as well as to organic change produced by injury. Neurological signs are relatively uncommon after head injury, and psychiatric and psychometric investigations are therefore important. Cases suspected of neurosis or malingering may have developed organic sequelæ after slight injury. Neuro-psychiatric control of these cases is desirable, from the onset till the final disposal of the patient. It is useless to send back to duty patients who are not fully recovered. The patient who denies his illness may develop neurotic reactions which become superimposed on organic symptoms.

Sulfonamides in the Treatment of Hematogenous Osteomyelites*

Wilson and McKeever (*J. Bone & Joint Surg.*, 1943:15) report studies on the influence of sulfonamide drugs on the course of acute hematogenous osteomyelitis in children, based on 31 consecutive patients entering the Los Angeles Children's Hospital from January 1939 to December 1941. Administration of sulfonamides to the patients admitted during the first nine months of the period was both spotty and indecisive. During the last two years sulfonamides were administered on the basis of ·0975 gm. per pound of body weight every twenty-four hours, and sulfathiazole was the drug employed. In several cases surgical treatment was also necessary. Twentyeight of the 30 surviving patients were examined early in 1942. Twenty-one had all draining sinuses closed, showed good bone reconstruction, were free of soft tissue damage and had no joint impairment. They were classified as having good results. All sinuses were closed in one patient but the ankle joint was fused. In one patient the lesion was unhealed and there was joint damage. Five patients still had draining sinuses without impairment of joint function. They concluded that chemotherapy with sulfonamide drugs is a valuable addition to the treatment of acute hematogenous osteomyelitis in children, and should be used routinely. The greatest effect of the sulfonamides is on the infected blood stream, which is usually promptly sterilized. The incidence of death and of multiple bone involvement is reduced by routine sulfonamide therapy. In an occasional mild case of acute hematogenous osteomyelitis, the patient may recover by chemotherapy alone without surgery. Well-timed surgical drainage of abscesses and pyogenic granulomata is not supplanted by chemotherapy in the treatment of acute osteomyelitis, and should never be withheld from a patient on the false hope that recovery will result without drainage.

Abstracts marked with an asterisk are received through courtesy of the United States Office of War information, 293, Hornby Road, Bombay, and those marked with a dagger through courtesy of the British Information Service, 3, Hanover Street, London, W. 1.—Editor, *J.I.M.A.*

ADDRESS

ALL-INDIA MEDICAL LICENTIATES ASSOCIATION

The following is the address* delivered by Dr. U. B. Narayanrao, Bombay, President, XXXII Annual Conference of the All-India Medical Licentiates Association held at Delhi on 24th and 25th April, 1943:—

In having elected me to lead for the ensuing year, for which I acknowledge my gratefulness to the Association, you have made me your servant no. 1. I expect to lead by being led by you with the same love and co-operation with which you have preferred to elect me to this highest honor.

I would at this juncture, take you back for a moment to a memorable day 30 years ago, to 3rd March, 1913, to be exact, when the then Delhi Licentiates met together under the guidance of the founder of our Association—the late Dr. S. P. Ramchandra Iyer, who with the help of other stalwarts, laid the foundation stone of the Delhi Branch. They elected a promising young hospital assistant as the first Secretary who, later, in spite of his manifold public and professional activities soon so rose up in the esteem of the Association that he was elected as the first member-president of its Agra Conference in 1938. It is a source of greatest pleasure to all of us to see him amidst us to-day, our respected Rai Bahadur Dr. Hariram. In spite of his recent serious illness he has been guiding his trusted lieutenants over here from his sick bed for making this Conference a success. His selfless devotion to the cause of the Association should be an example for all of us to emulate. Let me on behalf of the Association convey to you Sir, our heart felt gratitude and pray for your early and complete recovery and a long and prosperous life.

A Retrospect—It is in the fitness of things that on an occasion of this kind one is inclined on the one hand to be retrospective, to look back and mark the milestones on the road and, on the other, to try and look to the future and see what it holds. The last post-war period brought in a series of disabilities and disappointments. The retrenchment axe fell more powerfully on the Licentiate cadre. On the top of all, the Indian Medical Council Act was passed—giving the Licentiates the unique recognition of being inefficient at home and unfit for honour abroad.

It was at such a time—when the relations between the Government and the Licentiates were severely strained, due to the narrow-visioned and short-sighted policy of the former that the present deadly war commenced. ..... Parleys, arguments and counterarguments followed, the Souttar Medical Mission travelled throughout the country, and the Government at long last, after a further 15 months of deliberation found the necessity of acceding to our demands. We got justice in the shape of the formation of an Indian Army Medical Corps the formation of which was announced early this month.

Indian Charter for the Licentiates—The Association is thankful to the Government for this generous gesture of granting what it feels to be the 'Indian Charter' for

* Abridged.

the Licentiates. On behalf of you all I convey to the Government through the Hon'ble Sardar Sir Jogindra Singh and Lt. General Sir Gordon Jolly, our heartfelt and sincerest feeling of gratitude for having accepted our claims and granting us the basic rights and privileges. The Association in turn, I am sure, will reciprocate by giving all the possible support in the matter of recruitment of the Licentiates, if the Government are desirous of such a help.

Some Defects—I should, however, be failing in my duty towards both my Association and the Government if I do not point out certain glaring defects in the new scheme and make certain suggestions for its better working. Is the equality created in the new order only superficial, meant for the duration of the war?

The new scheme also badly lets down the existing men in the I.M.D.

I also believe that the question of recognition by the Indian Medical Council will not now come in the way of engaging our able men with public health and sanitary qualifications for services in military stations in India. I am confident that the scale of Civil Medical Practitioners employed in military stations in India will also be equalised and raised to the level of those serving within Indian limits. Licentiates with vast experience in special subjects should be engaged as specialists in those subjects whether possessing post-graduate qualifications or not. At present those who join the temporary civil S. M. S. with an option to resign after a month's notice are not being allowed to do so under a threat of application of Civil Services Ordinance (1942). Such methods will certainly deter persons from joining service, much less that of the army.

I would strongly plead that the Association should be taken into confidence in all future dealings with the licentiate problems. I can assure the Government that the Association will be quite willing to place their organisational and man power at their disposal, if such a co-operation is sought for.

An important factor that will come in the way of recruitment is the gradually deteriorating political situation of the country. The subject is beyond the scope of the Association to be interfered with, but I personally feel that it should not be easily brushed aside. This is a matter which calls for the very serious attention of the Government.

I. M. C. Act and Kazmi's Amendment—I just referred to the Kazmi's bill to amend the I. M. C. Act so as to include the Licentiates within its purview. The bill was lost. But we should not stop at the fate of the Kazmi Bill. We should continue our efforts unabated and urge our supporters in the Assembly to carry on.

Medical Education—Two factors, however, stand out prominently in the educational policy of the Government. The first and foremost is that the Licentiate class was and is kept up with the sole purpose of catering to the needs of their services.

Secondly, whenever improvements were made in either the premedical or the medical courses, a distinction was so assiduously kept up as to debar a Licentiate from rising higher. They (the Government) should declare their conviction to convert as many existing medical schools as possible to colleges, and close down the remaining ones, thus establishing one uniform minimum standard of education for the country.

Curriculum—The duty of the Association is clear: To continue the fight to have an uniform standard of medical education for the country and to abolish all the multifarious post-graduate diplomas and degrees, issued by different institutions; to see that uniform post-graduate courses are instituted for different specialities—before one calls oneself a specialist. In short to see that not a single licentiate is turned out any more so that there may not be any caste system in the medical profession of the country.

Our Organisation—The last thirty seven years' working of our Association has taught us certain important lessons. My appeal is to every Licentiate to join the Association. All those in military service should become members.

I. M. A. and Ourselves—One felt that the I. M. A. was not serious enough in handling the problems affecting the Licentiates, whether in the matter of amendment of the Indian Medical Council Act or in standardization of medical education, whether in the fight for emergency commissions, or in the abolition of medical schools. I am sorry to say that the I. M. A. did not put up a show expected of it. On the contrary, instances were seen where some of the chief executives of the Association openly supported the perpetuation of the medical school education. What is more, the I. M. A. is meeting in its Conference to-day at Patna, and would not change the dates to suit its Licentiate members in spite of their knowing our pre-arrangements. It is not my desire to apportion any blame on the I. M. A. for such a state of affairs, but I am pointing out to them the necessity of a change in their policy. I would put forward a few suggestions, which I believe would be practicable and pave the way for better understanding and mutual co-operation which is a prerequisite to amalgamation. The Working Committee meeting of the I. M. A. should be held in consultation with ours (if the latter is formed) in the same place each time. Questions which affect the profession as a whole, should be thoroughly discussed and plans formulated for concerted action to gain our ends. Especially subjects like abolition of medical schools and standardisation of medical education, amendment of the Indian Medical Council Act, emergency and war services and A. R. P. should be the few subjects to be tackled during the year. I am confident that with a spirit of mutual good will and co-operation the two Associations can work miracles and make it easy for their future merging.

I am deliberately not treading on the conventional path of a presidential address of touching on various other problems affecting the class. I am of the firm belief that once we have decided to destroy the cancer that has been eating into our very vitals, we should concentrate all our efforts and energies to attain that particular goal. The world has realised and acknowledged our supreme self sacrifice. Let us see the end of it as quickly as possible. Let the Licentiate die so that the medical profession may live. May the deliberations of our Conference be crowned with success.

NOTES AND NEWS

SICKNESS INSURANCE FOR INDUSTRIAL WORKERS

Throughout the whole world, some sort of insurance for the sick is in existence. It was absent in India and a move to establish a sickness insurance for the industrial worker is a welcome project. But to make it successful all the people concerned must co-operate. Industrialists, insurance companies and medical people should have their quota in the final formulation of the scheme. With this idea Prof. B. P. Adarkar, M.A., Officer on Special Duty, Sickness Insurance, Department of Labour, Government of India, has sent the following letter to us. This was sent to all the branches of the Indian Medical Association, and the letter is being printed for better publicity.

A Note and a brief Questionnaire on the Problem of Medical Machinery for Sickness Insurance of Industrial Workers in India.

The Government of India in the Labour Department have undertaken to prepare a preliminary scheme to serve as a basis for discussion with a view to the introduction of legislation to provide for Sickness Insurance for industrial workers in some of the major industries of India. A Sickness Insurance scheme ordinarily envisages two types of Sickness benefits to the workers: firstly, a cash benefit consisting of a lump sum payment depending upon the duration of the illness; and secondly, a medical benefit, including medical attendance, pharmaceutical and hospital treatment. One of the most important questions arising in this connection is that of the constitution of the appropriate medical machinery for provision of medical benefit.

2. Two main systems prevalent in other countries are (*a*) the Panel System and (*b*) the Medical Service System. Both the systems have their advantages and disadvantages. The Panel System recognised the worker's right to choose his own doctor and at the same time enables any member of the medical fraternity to apply for recognition as a panel doctor. On the other hand, the Panel System is mostly based upon individual practice, and as a single doctor cannot be expected under modern conditions to possess either the necessary equipment or the expert knowledge to deal with diseases in a comprehensive manner, the inevitable consequence is that for difficult or specialised bases, the patient has to be sent to a series of specialists. This defect is removed under the system of a regular medical service providing treatment in unified hospitals, where "group practice" is possible. Modern methods of diagnosis and treatment require an extensive and costly equipment of which only a group of doctors practising at the same centre can economically avail themselves; medical supplies, auxiliary staff and overhead charges are likewise relatively cheaper for several doctors working together. The repesentation of different specialists within the group of physicians enables the diagnosis to be settled and the treatment to be prescribed efficiently and without loss of time for doctor or patient. Group organisation enables doctors to maintain one another's morale and to afford one another opportunities for further study and for leisure. But there is also the question of certification. It is natural that the workers should choose a doctor who is known to be rather lenient in giving certificates of illness. As both cash and medical benefits depend upon certification, this is a matter of great importance to the solvency of the Sickness Insurance Fund. Under the system of Medical Service, not only will the doctors be under the direct control and supervision of the Fund, but also the possibilities of false certification will be minimised owing to the better morale to be found under "group practice."

3. Moreover, the Panel System tends to favour successful medical practitioners and the new comers are comparatively worse off: In the present state of the medical profession in which there is considerable stagnation and crowding, it may not be fair to open up new lines of practice for successful doctors to expand their practice. If the Medical Service System is adopted it may be possible to employ several thousands of struggling medicos, thus bringing good to both the workers and the medical profession. However, the Panel System has worked fairly well in some countries, while in others it has given rise to a series of evils.

4. This question must also be viewed from another angle. The exigencies of the present war have necessitated the employment of large numbers of medical men on a temporary basis. When the War is over, the problem is bound to arise as to how the demobilised medicos should be re-employed. Sickness Insurance scheme, which in the first instance will be applicable to a few industries, may provide possible employment on a full-time basis for some of these the demobilised medicos.

5. The Government of India have appointed me as Officer on Special Duty to investigate the entire question of Sickness Insurance. I have not yet formed any definite conclusions in regard to the choice of a particular system which would be suitable for India and I keep an open mind on this question. Before any final decision is taken, however, your opinion on this question will be welcome. I shall be grateful if you will kindly let me have your replies to the accompanying Questionnaire, and notes or memoranda pertaining thereto, at the following address, not later than the 15th of June, 1943: Officer on Special Duty, Sickness Insurance, Council Hall, Bombay (1). Sd/- B. P. Adarkar, Officer on Special Duty, Sickness Insurance.

Questionnaire

1. Which of the two systems, *viz.*, the Panel System or the Medical Service System do you prefer for Sickness Insurance in India? Please state reasons for your preference. 2. If you prefer the Panel System, should there be a standing contract between the Medical Associations and the Authorities of the Fund? If so, what should be the form of the contract? 3. If you prefer the Panel System, what should be the mode of payment? Should payment be by way of (*a*) a fee per insured person, or (*b*) a fee per case of sickness, or (*c*) any other basis? 4. If you prefer the Medical Service System, please state whether the doctor should be employed on whole-time or part-time basis? What do you think should be the scales of pay? What should be the basis of selection of doctors for the Medical Service? 5. Will it be possible to provide medical treatment in existing hospitals in the various industrial centres, if the Fund attaches its medical men to such hospital

(*Continued at foot of page 308*)

BOOK REVIEWS

PHARMACEUTICAL SERVICE IN INDIA—By M. L. SCHROFF. Presidential Address at the Indian Pharmaceutical Conference—Third Session, 1943.

In his presidential address Prof. M. L. Schroff has made an admirable case for the rapid development of an efficient and rational pharmaceutical service in India and has given a comparative picture of the backwardness of India in relation to Europe and America in this regard. Like all enthusiasts for a particular cause, he has not had the time to probe carefully into the causes underlying this state of affairs in India but has blamed every system and organization, barrring his own, for this chaotic condition. In short he wants to change the whole face of things by one sweep of his idealistic imagination and bring about a new order of things in which 'pharmacists' would play the noble role of 'a guide, a leader, an advisor, a counsellor, and an educator in health, in sanitation, in the solution of civic, economic and social problems'.

While every progressive individual would sympathize with Prof. Schroff, practical educationists and civil administrators would naturally look round and take a stock of the status of pharmaceutical service at present existing in the country before trying to reform it on the lines suggested by Prof. Schroff. Pharmacy in India is in a most deplorable condition in contrast with Great Britain and other countries, but this is only to be expected in a country where the drug industry did not exist in the true sense of the term and the only service that was called for from the so-called 'pharmacists' of this country was compounding and dispensing of medicines, and retail trade in drugs, surgical dressings, etc., every item of which was usually imported from foreign countries. The same situation, more or less, existed in Great Britain hundred years ago when events were moving towards the formation of the Pharmaceutical Society of Great Britain. There was little that could be properly regarded as the practice of pharmacy then as it is understood to-day, either in shops or institutions. The evolution of modern pharmacy took place in Great Britain concomitantly with the growth of national education, civic sense and responsibility, independence of outlook and establishment of drug industry. Circumstances over which we had no control kept India in the background in many spheres of which pharmacy is only one. No useful purpose would be served or any definite progress made in elevating the profession of pharmacy to its present world level by idle recriminations, as is evident throughout the presidential address, against groups of sister scientists and the Government and public health organizations of the country. To build up a respectable and ethical profession of pharmacy, what is needed is to improve gradually the education and cultural background of the members of the profession and to promote goodwill, respect and understanding amongst sister scientific professions. What may serve as a brilliant platform talk is not necessarily interpreted outside as sane and commonsense statements.

Prof. Schroff seems to have singled out medical men, particularly pharmacologists of Bengal as being responsible for all the ills Indian 'pharmacy' is heir to, although he has very few kind words for the botanists also. He himself quotes Dr. Koppanyi as having said that 'pharmacology is the very soul of pharmacy (P. 9)' and before long, he seems to have forgotten this and criticizes the Government for having appointed pharmacologists in committees and State institutions. He has a criticism to offer against the Government policy of appointing pharmacologists as experts in pharmaceutical matters but he conveniently forgets that by his own admission, pharmacology is a part of pharmacy. A scientific pharmacologist is just as capable of representing 'pharmacy' as a 'pharmaceutical chemist', 'pharmacogonist' or a 'practical pharamacist'. Prof. Schroff has brought out many interesting arguments in favour of establishing a virile pharmaceutical service in India but in his earnestness to strengthen his case, he has unfortunately overstepped himself and has made his address a forum for party politics and compartmentalism rather than a scientific discourse. The time is opportune for modern pharmacy to take deep root in India and what is needed is constructive leadership and combined effort from all interested in the development of this nation-building activity. The best help to elevate the profession of pharmacy can come from the pharmacologists and this can only be secured not by maligning that body but by seeking their active co-operation.

B. N. G.

THE MEDICAL ANNUAL—A Year Book of Treatment and Practitioner's Index. Sixtieth Year, 1942; Edited by Drs. H. L. Tidy and A. Rendle Short. Demy 8 vo., pp. liii+396. John Wright & Sons, Ltd., Bristol. Price 20s. net.

The publishers must be congratulated on their determination in bringing out the Medical Annual in spite of the destruction of the plant and a large stock of books at Bristol due to enemy action. Though diminished in volume this annual feature of medical publication has lost nothing of its former brilliance. The reviews on medicine, surgery, midwifery and public health are concise, lucid and interesting. It is not surprising because almost all the talents of the British School of Medicine have contributed again to this number.

Further work is reported by the Oxford School of Pathology on the antibacterial action of Fleming's penicillin. In future penicillin may prove a rival of the sulphonamides. Encouraging results are reported of the action of M. & B. 744 on Leishmaniasis. Resume of the investigations on war psychiatry, shelter health, mass radiology of the chest are also recorded. Triple dye jelly has been recommended for burns as a first aid measure. Gas-oxygen is the anæsthesia of choice in these cases. Experiences of chest and abdominal surgery in war injuries are recorded in detail. A note of warning is given to the inadequate sulphapyridine therapy in gonorrhœa. Proper doses with enough water to drink will diminish the total days of treatment. On the other hand small doses may make the cocci sulphonamide-resistent and a condition of symptom-free gonorrhœa carrier may result. It is apprehended that in future the medical profession may have to face a strain of sulphonamide-resistent gonococci due to this inadequate therapy. Much work has been done on vitamin K for the last few years. This number also includes reports of the administration of vitamin K to mothers to prevent hæmorrhagic diseases in infants. There is a long review on sterility and its treatment by artificial insemination.

The Medical Annual has kept up its reputation as the best book of reference for a general practitioner. B. P. NEOGY.

CORRESPONDENCE

The Editor is not responsible for any views expressed by contributors—EDITOR.

The Editor, *Journal of the I. M. A.*, Calcutta.

COMPLICATIONS OF TONSILLECTOMY

Sir,—As an addendum to the article "Complications of Tonsillectomy" (*J. Indian M. A.*, 1943: 12: 108) the undernoted case may prove of interest, as one of Hodgkin's disease following bilateral tonsillectomy.

The patient, a Hindu male, aged about 20 years was a first year student of the Patna Medical College, and was warded for the enlarged tonsils of moderate duration and symptoms. Soon after the operation, however, he started going down-hill rapidly, as Hodgkin's disease flared up; and he succumbed to it within three months. Diagnosis was confirmed by histological examination of gland section. I am etc.,

P.O. Radma,
Dt. Hazaribagh,
25-1-43.

N. L. JHA, M.B.B.S.,
C.M.O., Ramgarh Raj.

BOARD OF INDIAN MEDICINE, U. P.

The Editor, *Journal of the I. M. A.*, Calcutta.

Sir,— The Board of Indian Medicine, U.P., appointed a committee sometime ago to study the problem of curriculum of studies in Ayurvedic and Unani institutions in these Provinces, and the report of the committee has now been published, of which a summary appeared in the Press not very long ago.

The Science of Medicine has been unnecessarily divided in this country into several water-tight compartments as Ayurvedic, Unani and what has now been termed as 'Allopathic'. But on consideration one finds that this division is arbitrary and wrong. The Science of Medicine cannot be divided into any such or any other compartments—whether oriental or occidental—any more than any other science can. One never hears of Eastern chemistry or Western chemistry, or Eastern or Western Physics or in any other science. Why then this unnecessary cleavage in the science of Healing—the noblest of them all. All methods of treatment are included in the general term Medicine and must be utilised to the best advantage of sick humanity.

I suggest that there should be no such thing as Ayurvedic Colleges or Unani Colleges. There should be only Medical Colleges. In addition to the various modern departments of a medical college and its hospital, there should be one department with a ward for patients for Ayurvedic and one for Hikmat treatment and staffed with best vaids and hakims available. Every case admitted to medical wards should be given a choice as to the system of treatment he wants, and admitted to the ward according to his wishes. Then the various methods of diagnosis and treatment can be compared and the modern scientific research can be carried out on the drugs which prove efficacious. And the diagnosis can also be confirmed by other methods. In this way, spread over a number of years, we will be able to produce one Indian Pharmacopoeia, containing all that is useful in every system of treatment and that will be of more use to this country, than frittering away our energy and wasting our money on these various institutions. In addition, we will be moulding the whole medical science into one for the service and the benefit of humanity rather than making the artificial barriers into permanent walls, as we are doing at present.

Then there is one suggestion in the report of the committee, which is strongly objectionable. The committee has suggested a long course of 5 years and a short course of 3 years and called them college and school courses respectively. I suppose, in this they have followed the bad example set up by the Government in producing what are called Graduates and Licentiates. But I warn the Board of Indian Medicine from falling into this trap. Even in the so-called Western science, these two categories of Graduates and Licentiates are found only in India and nowhere else in the world. The Medical Council of India has now decided to do away with these with effect from the year 1947. Why then should this bad example be followed by the Board of Indian Medicine. There should be no such thing as a college and a school course. If the Indian systems are unfortunately to be kept separate, let there be one minimum standard of education, which should be passed by all without any difference of a college or a school course. And then there should be post-graduate courses, which will be open to all who care to go in for them. If the Board of Indian Medicine lays down this vicious thing as planned by the committee it will only result in good deal of heartburning and various superiority and inferiority complexes. Let them take a warning from the sister system in Western Medical Science and not follow the same risky path!

I may here add one more point. In Western countries where homeopathy is said to flourish as in Germany and in U.S.A., homeopathy is a post-graduate course, after a student has done his minimum medical qualification (be it M.B., B.S. or something else), but in India it is allowed to be practised by everyone and everybody, resulting in great harm to the public in general. I would suggest that this country should also follow the example of Western countries, where the system has flourished and make homeopathy a post-graduate course to be done by those M.B., B.S. students who care to go in for it. This will ensure a fair trial to homeopathy also.

I hope these suggestions will receive serious consideration of all the various Medical Bodies and Faculties, as also of the Government of the land. I am etc.

43, Cantonment Rd.
Lucknow.

H. N. SHIVAPURI,
M.B., B.S., CAPT. I.M.S. (RETD.)
Hon. Provincial Secretary,
I.M.A., U.P. Provincial Branch
and Member, U.P. Medical Council.

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and also share some of their expenses? 6. Who should control and supervise the Medical Section of the Fund at the various centres and what special precautions should be taken to prevent any leakages from the Fund? 7. What should be the method of certification? In particular, how would you prevent false certification? 8. Have you had any special experience on existing Sickness Insurance Schemes in any factory or concern? If so, kindly give all possible information relating to it.